

T H E
S E A T S and C A U S E S
O F
D I S E A S E S

INVESTIGATED BY ANATOMY;
I N F I V E B O O K S,
CONTAINING
A Great Variet, of DISSECTIONS, with REMARKS.

TO WHICH ARE ADDED
Very ACCURATE and C O P I O U S I N D E X E S of the
P R I N C I P A L T H I N G S and N A M E S therein containéd.

TRANSLATED from the L A T I N of
J O H N B A P T I S T M O R G A G N I,
Chief Professor of Anatomy, and President of the Univerfity at P A D U A,
By B E N J A M I N A L E X A N D E R, M. D.

I N T H R E E V O L U M E S.

V O L. III.

L O N D O N,

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Dr. H U N T E R.

SIR,

THE particular nature of the work before us gives a propriety to this address. A performance which stands upon the basis of anatomical science cannot seek the sanction of a more respectable name than that of Dr. Hunter. Great as the author allowedly is, and great as I have frequently known you confess him, it cannot but give additional weight to his work, and still more to my translation, that it is patroniz'd by you.

To you belongs the honour, in this country at least, to have stripped anatomical science of its mystery and disguise.—You have divested it of that pompous jargon and farrago of learning, with which it had been dress'd up in the schools, and have render'd its lessons, easy, perspicuous, and familiar. The science has, by your means, become more universally diffus'd, and more clearly understood. And perhaps there is no city in the world, where the attentive practitioners of the several branches of medicine, act with greater certainty to themselves, and safety to their patients, than in this metropolis.

For myself, I must confess that it is to you, chiefly, I owe that little share of anatomical science, of which I am possess'd.—From thence arises every degree of certainty that I find in determining the seats, and in great measure the causes, of diseases. And though I do not affect to despise, but even greatly esteem, the science of chemistry, and other branches of natural knowledge, auxiliary to medicine, I cannot, however, but give the first place to anatomy, as being the very basis, the ground work, and in-

DEDICATION.

deed, if I may be allow'd to speak thus, the grand luminary, of Physic.

What is it we do not owe to you in anatomy? You have not only rendered that which was already known, clearly attainable by the industrious and attentive mind, but have made many happy discoveries, which lead on to the most pleasing and important consequences. And though the public has seen many instances of this improvement already, we do not doubt but we shall still be witnesses to others. That unwearied assiduity with which you pursue your inquiries, in spite of the most lucrative avocations, cannot but produce the most useful effects.

To this assiduity the community stands greatly indebted. And this the Community will in general allow, however the jealous few may retract. It is a circumstance frequently attendant on great characters, to be envy'd and detracted from while living: And nothing but death itself can pay the just reverence to such reputation.

You will however permit me to hope, Sir, that it will be long, very long, before full and ample justice be done to your character. And this you will the more readily believe, when I assure you that, in such a desire, I am far from being destitute of the most selfish regards. For I cannot but hope, from the many instances of favour and partiality I have met with from Dr. Hunter, that I shall, during the course of our residence here, be indulg'd with the honour of subscribing myself

his very respectful friend,

and greatly obliged humble servant,

BENJ. ALEXANDER.

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THE
SEATS and CAUSES
OF
DISEASES
INVESTIGATED BY ANATOMY.
BOOK the FOURTH,

Wherein the Disorders relative to Surgery, or those which
affect the whole Body, are treated of.

LETTER the FORTY-NINTH

Treats of Fevers.

1. **A**LTHOUGH you not long ago receiv'd a very long letter from me, you may now, perhaps, expect a longer, as the subject of this is fevers; diseases which are of all the most frequent, the most various and manifold. And, indeed, you see that the first section of the fourth book, which is assign'd to them in the Sepulchretum, is one of the most prolix. Yet this letter, though it may not be the shortest, will, at least, not be one of the longest. For why should I here, in imitation of that section, repeat what I have already sufficiently said, or anticipate what I shall hereafter say, with greater propriety, when treating of a great number of disorders, each of which has its proper fever, if I may so speak, naturally join'd with it? And in that section there are a great number of observations which Bonetus himself confesses are propos'd in other places, whereto he refers; and out of those of which he makes no confession, I think I have found others besides, in regard to which he might have made the same confession.

And, indeed, I have more than once observ'd histories to be put down twice over in that same section; which, however, I do not particularly refer you to, because I imagine that you yourself, if you read it more accurately, and with more attention, than I, will remark a still greater number; and at the same time be surpriz'd at some in which you read of incredible things; as, for instance, that in a pestilential hemitritæos (*a*), a vast quantity of bugs or flies was found betwixt the meninges of the brain; that in certain pestilences (*b*), "vipers and lizards" had been generated in human bodies, in several parts, which, after the most excruciating pains, kill'd "a thousand men every day;" or (*c*) that "the livers both of men and horses were found to be full of toads."

It is my determination, however, to copy in this place some observations in particular, which still remain uncopied among the papers of Valsalva; in most of which you will rather be surpriz'd at this circumstance, that after violent fevers, or those that kill unexpectedly soon, scarcely any thing, and sometimes nothing at all, is found, which might bear any cor-

(*a*) Obs. 57. § 11.

(*b*) Obs. 62. § 8, & 9.

(*c*) Ibid. § 10.

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repohdence to, or competition with, their violence or impetus ; so far is the cause by which fevers become fatal nor uncommonly latent.

2. A man, about thirty years of age, was seiz'd with a slow fever, which was attended with no symptom worthy of remark, except that his appetite was entirely lost. The pulse and strength of the patient fail'd every day ; and at length he died suddenly.

The body being dissected by Valsalva, all the viscera were found to be in a sound state, except the following. The gall-bladder contain'd a bile which was ting'd of a brown colour ; and in this bile was a calculus of the bigness of a *dens molaris*, of a pallid colour, and easily friable. Internally it was hollow, and had many other calculi included in it, and those of a black colour. The lungs were distinguish'd with black spots. In the pericardium was little or no serum. The blood in this body was very grumous, and in the ventricles of the heart was coagulated.

3. Whether you suppose this to have been a slow or a malignant fever, certainly the preternatural appearances that were found by dissection, frequently occur in others also, who are not carried off by a disease of this kind, and particularly not by a death of this kind. It does not so frequently happen, that those appearances are seen in the heart itself, which Valsalva saw in a boy whom I suppose a hectic fever carried off ; although there are some things in regard to which you would wish to know whether they existed in the living body, or not, and perhaps even in the body after death.

4. A certain boy died emaciated. The heart was strongly connected with the pericardium ; which being separated therefrom together with the fat, through all the external surface of the muscles of the heart, certain whitish bodies were seen lying at a distance from each other. Most of these resembl'd small grains of millet-seed in their figure, magnitude, and colour ; but some were a little larger, and of an irregular figure. On the surface of the diaphragm the lymphæducts appear'd pretty evidently.

5. But now let us go on to some things that relate to another kind of fever, which the same person observ'd in three women.

6. A woman, about thirty years of age, of a bilious temperament, who already had labour'd under a double tertian fever for a long time, receiv'd a blow upon the abdomen with a stick. Being receiv'd into the hospital of St. Mary de Vita, she complain'd only of a pain in her abdomen. But on the third day after receiving the blow, she began to be delirious. Her pulse was small and quick. She threw up from her stomach, more than once, a humour like water wherein fresh meat has been wash'd. At length, the disease increasing every day, she died.

The muscles of the belly were found to be contus'd ; yet in such a manner, that no mark of contusion appear'd either externally, or within the abdomen. The liver was whitish, and inclin'd to hardness in some degree : the gall-bladder, which was of a remarkable magnitude, contain'd about three ounces of bile, of a black colour ; some portion of which fluid was also found in the stomach. The other parts of the belly were in a natural state. In the thorax, the lungs, on that surface which was turn'd to the vertebræ, were affected with a considerable phlogosis, but in other respects sound. The right ventricle of the heart contain'd a small polypous concretion.

7. Whosoever

7. Whosoever had consider'd only the blow upon the abdomen, and the complaints made by the woman of pain in this part, would have attributed the symptoms that follow'd to some viscus of the belly having been injur'd thereby. But the dissection show'd, that whatever disorder there was in the liver related, rather, to that long-continu'd fever; or, at least, in the opinion of Valsalva, who prefix'd this title to the observation, *De Tertiana Duplici*, whether he suppos'd the whole of this morbid appearance to have related to the causes of that disorder, or to the effects of it. What had been added thereto on occasion of the blow, in a woman of a bilious temperament, the inspection of the brain, perhaps, might, as the delirium seems to hint, have shown. For as to the considerable phlogosis of the lungs, who can, for a certainty, affirm that, as it occupied the posterior parts, it was not owing rather to the supine posture of the body; as I have admonish'd on a former occasion (*d*), and as we see frequently happen? And this I would have you suppose to be said in regard to the following history also.

8. A virgin, of two-and-twenty years of age, having labour'd many days under a double tertian, and being afterwards seiz'd with an ardent fever, and troubl'd with a pain of the head and the whole body, was carried off thereby.

In the belly, at the extremity of the intestinum ileum, in the part where it is connected to the mesentery, were prominent many little bodies, which in their magnitude, form, and colour, resembl'd the granules of gun-powder. In the uterus many round bodies, like glands, were protuberant; on the rupture of which a viscid humour was discharg'd. Except these things, all the parts of the belly were in a natural state. But in the thorax, the lungs, where they were turn'd towards the back, were slightly inflam'd; and in the right ventricle of the heart was a polypous concretion.

9. Whether these round bodies were protuberant on the external or the opposite surface of the uterus; and, in like manner, whether those black little bodies, or rather points, possess'd this or that surface of the intestine; it does not sufficiently appear from what cause the tertian in the first place, and after that the ardent fever, had its rise. It does not, I say, sufficiently appear: not that it escapes me in what manner very learned men have accounted for recurrent fevers, from a viscid humour being discharg'd out of more than one lurking place, within a certain time; or that those black points might be very small inflammations, already degenerating into a gangrene: but because I know that both of these diseases have been in many, who had not been afflicted with fevers of this kind, but with quite different disorders, which I look for in this history in vain, where the seat of those disorders is pointed out.

10. A woman, of five-and-twenty years of age, and of the same temperament as the former (*e*), had come into the same hospital at the time when she began to be affected with a difficulty of breathing. With this difficulty were join'd a pain in the left part of the thorax, a certain sound of matter within this cavity at the time of respiration, and a pulse which was soft indeed, but very frequent. On the fifth day the jaundice came on, which, after having continu'd quite to the eighth day, vanish'd. Then, by reason

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of the obstinacy of the fever, venæsection, which had been made use of on the first days, was again repeated. At length, death suddenly came on; for the fever was not of such a kind as to threaten death at that time.

The belly being open'd, every thing appear'd to be sound; except that half a pint of water was found in the whole of that cavity: which circumstance had frequently, however, been found in other bodies also. In the thorax, the right lobe of the lungs, which adher'd to the ribs on its superior part, was inflam'd on its inferior part; and from the substance of it, when cut into, a little serum was discharg'd. Yet the left lobe was not only free from the ribs on all sides, but was likewise found to be in a sound state. From the right ventricle of the heart, a polypous concretion, which had its basis in the fasciculated texture of that cavity, was produc'd into the vena cava, being every-where of a firm compages, and of a colour in one part pallid, and in another somewhat red.

11. If Valsalva himself had not entitl'd this observation *De Febre Ardente*, I should have class'd it rather with the peripneumonies: although, even on this supposition, we should not very well understand how it happen'd, that the patient died suddenly. Nor yet does it appear why, although the pain was on the left side, the inflammation was on the right; unless, perhaps, where the one or the other is mention'd, one side was put down for the other, by a slip of the pen, as frequently happens. This, however, is certain from the aphorism of Hippocrates (*f*), that, in respect to this disease, but an ill omen is to be drawn from a jaundice being added to the fever before the seventh day. But if you suspect that any thing malignant had lain hid in any of the fevers hitherto propos'd; you will still more suspect it in that, which Valsalva has left us the description of in the following manner.

12. A man, of forty years of age, lay ill in the same hospital, by reason of a wound in the tibia with a blunt instrument. And when his wound began to be in a very good state, and he himself was quite free from fever; he was suddenly seiz'd with an acute fever. And this growing more and more violent, he was taken off thereby. In the carcase was no morbid appearance, except that the blood kept nearly its natural fluidity.

13. What is more natural in this case, than to think as Riverius (*g*) did in a certain case of his? I mean in the case of a boy, who had been taken off by a very acute fever, attended with symptoms which brought on a great suspicion of inflammation in the viscera; whereas, by dissection, he found "all the viscera" (for so Riverius has written, and not, as, through the great carelessness of the printers, it is copied into the *Sepulchretum* (*h*), "all the symptoms") in a very good "state;" and, not meeting with any apparent cause of so many symptoms, accounted for the disease from some latent malignity.

And this you will perhaps do the more readily, because here, at least, the fluxile state of the blood was apparent. For some of the most eminent physicians have taught us, that a great number of malignant fevers are join'd with a dissolution of the blood. And these we have also follow'd, in ex-

(*f*) 6. ex Sect. 4.

(*g*) Cent. 2. Obs. 83.

(*h*) in Additam. ad hanc Sect. Obs. 10.

plaining other observations of Valsalva (*i*), yet with this restriction, that as malignant fevers do not all discover themselves in one and the same way, we do not think they ought to be deserted, who have affirm'd, on the other hand, that many of them are also join'd with a concretion of the blood. For the opinion is favour'd not only by others, but by this observation in particular that I am about to subjoin, which is the last I shall give you from the papers of Valsalva, and is inscrib'd with this title by himself, "Of a malignant fever and obstinate costiveness."

14. A nobleman, about forty years of age, who, even when in health, was subject to such a costive state of bowels, that he could never go to stool without the use of purging medicines, having remov'd his habitation from his native country, where he liv'd in a thin air, to one that was more thick; after a short time was seiz'd with a fever, which was attended with no other symptom but this, that the patient complain'd of continual anxiety of mind, and of watchings. But a pain of the head having come on in the course of the fourteenth day, and the pulse now and then appearing, and soon after being so contracted, that frequently it could not be perceiv'd by the physician; he made an exchange of life for death on the same day.

The fundus of the stomach was ting'd of a black colour. The intestines, and especially the large ones, were contracted. The other viscera of the belly were sound. The blood was very much coagulated.

15. I will now join to these dissections, some instances either of observations or animadversions of my own, or my friends, that relate to the kinds of fever taken notice of already, and to others. And I said some instances; for as, in observance of the above order, we begin with slow and hectic fevers; you have already had others in the letters before sent to you; either when I took notice of an abscess of the thorax purposely, or even sometimes when I took notice of an abscess of the belly (*k*) in a transitory manner. I will add one example or two here, even without a manifest abscess.

16. A man who was greatly emaciated, and therefore thought by some to have a phthisis, though it seem'd otherwise to us, at length came into this hospital, where he made his exit from this life, after the beginning of March, in the year 1747.

The thorax, the belly, and the head, being dissected, the lungs were found to be sound, and the other viscera without any taint, except that the dura mater was very thick, and the brain very lax. And I moreover observ'd, when I was going about to demonstrate some things in relation to the posterior part of the spinal marrow, to the students; that this membrane, the dura mater, could not be drawn off so easily as at other times; and I was even under a necessity of proceeding gradually, in order to separate it from the neighbouring tunica arachnoides, without laceration. However, the skin was very hard in this body, as it generally is in tabid bodies.

17. This hardness of the skin, whether you try it with a knife, or with needles, is very evident; and not only in phthisical persons on whom many have experienc'd it, but in others likewise who have been greatly emaciated, either because no fat remains in the subjected membrana adiposa, by the

(*i*) Epist. 4. n. 9. & Epist. 7. n. 2.

(*k*) ut Epist. 46. n. 27.

unctuousness of which that might be preserv'd soft, or because the flesh is collaps'd, not only for want of fat in the interstices of the muscles, but also for want of humours, which were, in great measure, deficient in their vessels in several places, so that the skin being no longer distended, is contracted into itself, and becomes thicker; by reason of which contraction, and of the rugæ that are produc'd thereby, and these not only very large but very small, the smoothness of it is lost; for thus I interpret Morton (*1*), who speaks of this subject. On the other hand, the skin, when distended by the fat beneath it, is not only shining and smooth, as every one sees, but is preserv'd very soft, as even the confectioners and makers of sausages know, by cutting the skin of hogs flesh into very small parts; since they use the less labour in proportion as the creature was fatter, and the greater in proportion to its being less so. But let us go on to the other dissection, in which, indeed, evident injuries of the viscera, both in the thorax and abdomen, appear'd, but without any abscess.

18. The body of an old man, who had been so emaciated as to be said to have been waisted away by a marasmus, which was the effect of old age, was brought into the college, that I might therewith, at least, make a beginning of anatomical demonstrations, before the end of January, in the year 1741.

In the belly the mesenteric glands were not so minute as they generally are at that age; and not only this, but about the iliac vessels, from the origin thereof quite to the thigh, were a great number of glands, and those very large; so that these vessels were cover'd over with a kind of continu'd chain of them, as it were, some of which were equal in length to two or three inches, being large even in respect to thickness; so as to make it not surprizing, that these arteries should seem to have their parietes somewhat inflected, and in a manner varicose, in consequence of being attended by such glands as these, and press'd upon by them: yet these glands, when cut into, did not seem to deviate from the sound constitution of lymphatic glands.

But the spleen, although rather small in other of its dimensions, was thicker than is natural, particularly in the middle; and besides that the membranous connections, by which it is join'd to the diaphragm, were themselves also become thicker than usual, it had its coat not only thick likewise, in the very middle of its convex surface, but hard also for a space as large as a circle, the diameter of which was scarcely shorter than two inches, would occupy; and indeed in some part of that space it was already bony; and to this coat was annex'd internally, a kind of trunk of a vessel as it were, which was itself hard also, and went into the substance of the spleen. This I also remark'd in regard to the spleen: the artery which went to it was somewhat narrower than is natural, from its origin at the coeliac to the extent of some inches, till, at the place where it began to wreath itself into many flexures, as it generally does, it became wider.

The bladder, which was so distended with urine as to raise itself up above the pubes, had its coats in a thicken'd state; and being compress'd by the

hand, did not easily discharge the urine; nor could all that fluid be press'd out: perhaps by reason of the prostate gland being enlarg'd, and every where protuberating in the cavity of the bladder, about the orifice of the urethra; for what appearances I found in this gland, I have already told you in the forty-fourth letter (*m*).

The thorax and the pericardium being open'd, we found the heart to be destitute of all fat, of an ash-colour in its surface, and not smooth. The great artery had very hard valves: and this tube itself, at a small distance above these valves, was rigid with scales, that lay under the internal coat, and were entirely bony: but the beginnings of these only, or white spots, appear'd in that part of the trunk which is in the belly, and in the iliac branches thereof.

Nor ought a kind of singular disorder of the carotid arteries to be conceal'd: for these had no sooner ascended to one half their length, but they there distorted themselves like a cochlea; and immediately return'd to their original straitness of direction; and so obstinate was this flexure, that, if you extended out the arteries in a strait line, they soon after restor'd themselves to the same state of contorsion, upon the removal of the hand.

19. Having seen these several peculiarities, I was greatly chagrin'd to find that it was impossible to learn any more circumstances in regard to this old man while living, (he having been an unknown pauper) than that he had evidently died in consequence of being consum'd by a great loss of flesh. And whether many of the appearances found in the body after death, were the effects or the cause, or rather both causes and effects, of this wasting, you yourself will judge. Certainly in turning over this section of the Sepulchretum (*n*) you will find, that, in a hectic body (*o*), other glands of the lymphatic kind were encreas'd; and that in others (*p*), the heart was not without some disorder, as in that boy even of whom we spoke above (*q*) from Valsalva; not to say in another (*r*), from the section already referr'd to, who, having been brought into a marasmus, had the heart, like our old man, "stripp'd of all its fat," and unequal with rugæ.

I omit other circumstances from whence it might likewise be understood, that the blood, and the humours secreted from thence, could not, in this case, be impell'd in the manner that was requisite, so that a proper quantity of the one and of the others might be daily supplied, and thrust forwards into all the small vessels; for if in the greater part of these, the blood and humours are deficient, the whole body must of course be collaps'd into itself; and on this collaps'd state, if we except the bones and the cartilages, the whole affair of great leanness depends. For all the solid parts of muscles or membranes bear a far less proportion to the blood and humours, with which their vessels and cells are extended, than the common people imagine; so that it would be almost incredible to how little a substance the body is reduc'd, when the fluids are dissipated and fly off, if the most learned men had not demonstrated it by the collection of many experiments. Yet among

(*m*) n. 20.
(*n*) libri IV. Sect. 1.
(*o*) Obs. 16. § 2.

(*p*) Obs. 12.
(*q*) n. 4.
(*r*) Obs. 56. § 7.

these experiments I should think it was less natural to recount that which was made by Lancisi (*s*), with another view, I mean by a long continu'd maceration of the human heart. For with the water, when often renew'd, many shreds of membranes and fibrillæ, which the water has gradually disjoin'd, are thrown away.

However, there is no more general cause of the body being made destitute of blood and humours, and growing lean, than the transit of the chyle thro' the mesentery being made more difficult, whether this difficulty be in the ultimate glands of the mesentery, or in the first, or promiscuously in many of them, at the same time. An example of the former difficulty you will have from Cowper (*t*), who, in a young heifer that was very lean in her whole body, found two of those glands which compress'd the receptaculum chyli by their tumour. And an example of the second difficulty will be given by the celebrated Fantonus (*u*), who, in a man that had been confin'd for many months by a slow fever, found chyle only in the *vasa lactea primi generis*, being retarded, for instance, by the obstruction of the glands, to which those vessels were carried. And many observations of the third difficulty will occur, which you may add, together with those two, to the Sepulchretum.

For even not a few are to be found, merely in the volumes of the Cæsarean Academy, that have been publish'd since the last edition of the Sepulchretum; that is to say, “ of the mesenteric glands being totally obstructed “ and swell'd (*x*); of all the glands of the mesentery being stuff'd up, together with the pancreas (*y*); of the mesentery being fill'd with tumid “ glands (*z*); of the mesentery being every where crowded with scirrhus “ glands (*a*); of the chylous vessels being here and there obstructed (*b*);” and these observations were made upon bodies that had been affected with “ an atrophy; a hectic fever; on one that was wholly emaciated; on one reduced to extreme leanness, which follow'd a slow hectic fever.” And indeed, when you twice read, that in an atrophy the mesentery was fill'd (*c*), and render'd unsightly (*d*), “ with innumerable steatomatous tumours;” you will scarcely doubt, in both cases, but the glands had been chang'd into those tumours from the stagnating chyle; not to say any thing of the mesentery being found fill'd, after “ a slow fever, with little abscesses and ulcers, “ and that universally (*e*).” But if you choose to think differently, even with my consent, and not suppose the seat of those tumours or abscesses to have been in these glands; yet in so great a number of both of them it could not but happen, that many of the glands, and a great number of the vessels that transport the chyle, must have been compress'd, and the transit of this fluid, in great measure, prohibited; as in the observation also of the celebrated Phil. Conr. Fabricius (*f*), a tumour “ equal in magnitude to some

(*s*) De Mot. Cord. Propos. 53.

(*t*) Vid. Aët. Erud. Lips. A. 1699. M. Feb. ad Tab. Cowperi 34.

(*u*) Anat. corp. hum. Diss. 5.

(*x*) Dec. 3. A. 9. & 10. Obs. 218.

(*y*) Cent. 3. & 4. Obs. 119.

(*z*) Aët. Tom. 1. Obs. 59.

(*a*) Eorund. Tom. 4. Obs. 146.

(*b*) Eorund. Tom. 8. Obs. 125.

(*c*) Cent. 6. Obs. 16.

(*d*) Dec. 3. A. 9. & 10. Obs. 214.

(*e*) Dec. ead. A. 3. Obs. 139.

(*f*) Progr. quo Observ. in 3. cadaverib. vers. fin.

"fists, and scirrhus," could not exist "in the center of the mesentery" of an infant, who died of an atrophy, without pressing upon the *vasa chyli-fera ultimi generis*. And indeed that very experienc'd anatomist (g) has, in another place, the dissection of a woman, who died of a "slow wasting of flesh," all of whose viscera shew'd no unusual appearance, except that "the glands of the mesentery had entirely disappear'd." But he has immediately subjoin'd, that in bodies of this kind, "unless they are carried off by a very advanc'd old age," (from which this woman was far distant) "these glands, if not altogether scirrhus, are nevertheless, for the most part, found to be remarkably tumid." And when they are entirely lost, is not the passage of the chyle retarded by this means also; which passage, if they administer thereto by no other means, they are useful in promoting, by diluting with the addition of the lymph at least? And as, when these glands are diminish'd, this lymph is diminish'd also, may we not, in some measure, ascribe the emaciated state of most old men to this cause also, among others? However this may be, as it is certain that these glands do, for the most part, decrease in old men; if in the old man, whose history I have given you, they were not so small as they generally are; it is very probable that this had happen'd on account of their obstruction; and that for this reason, the passage of the chyle being become difficult, the body had sunk away in a marasmus.

20. There is on the other hand, to go on to another kind of fevers, when we wish the bodies of those who labour under fevers to be, in some measure, collaps'd; that is to say, by the quantity or turgescency of the vitiated humours being diminished. And this, I remember, was desir'd by the physicians who were my preceptors, in the case of a virgin at Bologna, in particular; as well as at other times; and that not rarely neither, by all who do not neglect the aphorisms of Hippocrates (h). For this virgin having fall'n into sweats during an acute fever, the acuteness of the fever, indeed, soon went off, but not the fever; of which she did not get entirely rid for more than a hundred days afterwards. However, as the fever did not go off in so long a time, so the face of the patient did not fall much, but continu'd full, and never pallid. Therefore, when the fever seem'd to be, at length, gone, and the virgin had got up from her bed, behold the fever again discover'd itself, as they had expected; and that not slight, nor of few days continuance; till it at last went off, together with that fullness of body, so as to return no more.

I would not, however, from the narration of this case; wherein that sweat may seem to have been of less advantage in taking off the acuteness of the fever, than injurious in producing the fever for so long a time; I would not, I say, have you believe that I am in the number of those who are even more averse to sweats, in increas'd fevers, than, a little before the time we are speaking of, those physicians were to stools, who had frequently observ'd patients of this kind to have been carried off in a miserable manner, from having taken purging medicines. Without doubt nothing is more natural for men, than to avoid one extreme error, and run immediately into another.

(g) Propemptic. ad Dissert. J. B. Hoffm.

(h) Vid. 38. Aph. Sect. 2.

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Different regions, different seasons of the year, different ages, different degrees of strength, different conditions of bodies, diseases, and causes, require different treatments. But scarcely any bear violent medicines without danger; and much less if the matter is crude; or, if concocted, it is not drawn to that part “where nature most inclines,” to use the words of Hippocrates (*i*), “through the passages that collect it together.”

Yet nature does not incline to the same place always, nor in all cases; but to different places at different times; as, for instance, to the kidneys, to the intestines, to the skin. And that nature does verge to the skin, and cures the most violent disorders by sweats frequently; and among these fevers, although that most ancient master (*k*) had not expressly taught it, I nevertheless believ’d that no physicians could be ignorant. However, the flying from one extreme carries even some of the most learned men so far, as to assert, that they cannot find examples of critical sweats, even in Hippocrates himself, in whom Malpighi (*l*) had pointed out so many unsuccessful examples of stools. But these gentlemen have been sufficiently answered by the celebrated Haller (*m*).

And others, though they do not assert the same thing, nevertheless make such objections to those who endeavour to excite sweats, as may make the physician fearful, who studies opportunely and cautiously, that is mildly, to assist nature; which is a little sluggish indeed, but evidently inclining to the skin: as if, truly, almost the same objections might not, with justice, be made against purging, which they so much recommend. Others are, moreover, made averse to sweating remedies, by this consideration, that the first use of sudorifics began, as they themselves say, among the Arabians. So the most advantageous use of the Peruvian bark first began among the Americans: nor are all the inventions of the Arabian physicians to be discommended. And certainly they were not Arabian physicians, from whom Pliny, in so many places of his natural history, has taken the account of roots, seeds, herbs, or other things, which were useful in exciting sweats.

Nor was Andromachus an Arabian: yet from him Galen (*n*) has described an antidote, which was even given to persons who had fevers, “and powerfully excited sweat:” nor did Oribasius (*o*), nor Aetius (*p*), nor Paulus (*q*), come from an Arabian, but from a Grecian school; yet not one of them has omitted to take notice of medicines, by the taking of which internally, sweats may be excited: and, indeed, the two last have written a chapter expressly upon sudorific remedies. Yet I do not say these things, because I think that they are not equally known to the same learned men as to me; but in order to show you, that, by reason of a too great forwardness to disapprove some certain remedies, it now and then happens, that we seem to be quite forgetful of those things whereof we are very well inform’d.

(*i*) Sect. 1. Aph. 21. (*k*) Sect. 4. Aph. 36.

(*l*) Resp. ad Lipar.

(*m*) in Boerh. Prælect. ad Instit. §. 425. not. p.

(*n*) De Compos. medicam. sec. loca 1. 8. c. 7.

(*o*) Medic. Collect. 1. 8. c. 17. & de Virt. Simpl. ubi de Calamintha.

(*p*) Medic. tetrabib. 1. 1. Sermon. 1. ubi de ead. & Sermon. 3. c. 48. & 157.

(*q*) De Re Med. 1. 1. c. 48.

21. It is, therefore, the business of a prudent physician, in epidemical constitutions of fevers, to adhere obstinately to no prejudg'd opinion; but to observe attentively, of himself, where nature inclines; and not to conclude from one observation, or accidental cure, what ought to be done in other cases. I have seen a woman labouring under a continual fever, who, after blood being taken from her arm, in which I remember there was but little serum, was immediately seiz'd with a much more violent fever, like an accession, or paroxysm; which had hitherto been unusual. And, indeed, this was the true accession of an intermittent, which was succeeded by another on the following day; and within four days the woman was freed from her fever. This accession, therefore, which had at first seem'd dangerous, and immediately succeeded, in so violent a manner, to the loss of blood, prov'd to be salubrious: for the fever, from a continual one, became an intermittent; which went away of itself easily and soon. But that change was fortuitous, and would even have come on without any loss of blood. There is no occasion to add other examples, that are frequently met with in the practice of physic, in order to shew you the intention of what I assert.

However, not only in the event of fevers, but also in the prognostic indications of the event, those which accidentally indicate, ought to be distinguish'd from those that do not accidentally indicate. Among the latter, the common people gladly place even pustules and little ulcers, which happen about the lips; and, perhaps, not without reason. For Albertini also (*r*) confess'd that these were the marks, or tokens, of *crises*, "which follow after;" and I have, more than once, observ'd that the event answer'd our expectation: although, at the same time, I remember that, in a very bad continual fever, our hopes were disappointed; notwithstanding they appear'd of themselves, not "after a fright," and on the fourteenth day of the disease, and "urine was at the same time discharg'd with some little heat:" and why I have made these remarks you will easily know, if you inspect some certain places of the *Commercium Litterarium* (*s*), which relate to these little ulcers or pustules of the lips. Yet in regard to this sign, I have not so many observations as I would wish.

But another sign, which I had begun to observe by chance, as frequently is the case, has very rarely happen'd to fail, in a very great number of observations: I mean a sign taken from the inspection of the urine. For I continu'd the more attentively, and frequently, to attend to it, from the time I lit on two passages of eminent physicians; which you will see transferr'd into this section of the *Sepulchretum* (*r*), although for some other reason; I mean of Joubertus and Gradius: Joubertus, I say, for the words which are copied there, as if from Schneider, are not the words of that author, but of Joubertus, who is expressly quoted by him in his treatise on the gout, in the first book and sixth chapter; in which manner Schneider ought to have been quoted; and not "in the chapter on the gout:" and in another place, at least, of the *Sepulchretum* (*u*), where I have observ'd that the greatest part

(*r*) in Opusc. de Cort. Peruv. Tom. 1.
 Comment. de Bonon. Sc. Instit.
 (i) A. 1745. Hebd. 31. & A. 1739. Hebd. 28.

(*r*) Obs. 40. & Schol.
 (u) l. 3. Sect. 25. in Schol. ad Obs. 14.

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of a certain scholium is taken from Schenck (x), those words are attributed to Joubertus. This author, then, has asserted, "that in many patients who have fevers, (and especially when the disorder has been brought to a crisis) small sandy particles are copiously discharg'd with the urine; without any nephritis being present, or having preceded." And Gradius had formerly taught, that sand "appears in the decline of fevers, and after long fevers;" but that they are easily distinguish'd from those which prove the existence of calculi; "because if they are compress'd and rubb'd betwixt the fingers, they are readily dissolv'd."

Moreover, I have not only in fevers, whether they were vernal or autumnal, in summer or in winter; whether intermittent or continual; whether benign or malignant, or join'd with petechiæ, or of a middle nature betwixt them; or sometimes very slight, long or short; whether in children or young men; whether in men or women, and these some of them pregnant; or, finally, whether in those that have their origin from more frequent, or more singular causes; as for instance, from a corrosive poison being accidentally, or purposely, taken; I have not only, I say, in fevers, but also in some other disorders disjoin'd from fevers, and particularly in severe pains of the head, and some apoplectic affections, sometimes even in those of old persons, observ'd, that as often as these sandy particles appear'd, the fever was in fact either at an end, or very near to an end: but not unfrequently when it had not as yet begun to decline, or if it had begun, when it did not go on so evidently to decline as not to leave the event still more doubtful than I would wish.

And as in the end of the disease, or in the decline, that is already certain, and becoming more considerable every day, they have confirm'd the victory of nature; so before the beginning of the decline, or in a decline, which is still doubtful, they have, for the most part, portended the same victory: for either the disease has happily gone off altogether, or if a relapse has follow'd, it has been so much the slighter and shorter. Once only, as I have already told you (y), to a dropsy, which had follow'd a fever, and gone off, other violent and not very short disorders, but those also of such a kind that the patient recover'd from them, succeeded. But once, in all, the death of a patient was the consequence of an autumnal malignant fever; which patient I never saw either before or after that one day; so that whether he was taken off by the fever, or by some error committed afterwards by himself, those who were about him, or by the physician, I do not certainly know; nor yet whether those sandy particles had been observ'd during the whole time of the disease, or had appear'd on that day for the first time.

Nor do I speak of those which appear always, but of those which begin to discover themselves only when the vigour of the disease is approaching near to a decline, or when the decline is already begun, and "adhere to the surface of the urinal," as Gradius says (z); not "of the urine," as you will read it falsely copied in the Sepulchretum (a); where not even the book

(x) Obf. Medic. l. 3. ubi de Ren. Symp-
Obf. 5.

(z) Prax. in Non. Almanfor. tr. 3. c. 14.
(a) in Schol. cit.

(y) Epist. 8. n. 10.

in which he has said these things is pointed out. That is to say, looking at the urine in a very clear light, you will observe thin sandy particles adhering to the sides of the glass chamber-pot, and sometimes swimming on the surface at the same time, reddish for the most part, whitish very seldom; such as I remember to have seen in a certain young man, when a fever that was malignant, and attended with petechiæ, began to decline.

22. What I have mention'd of this young man, brings back to my mind, that the blood, which in his disorder was taken away at four different times, at one time by the lancet, and at another by cupping-glasses; besides that it was more fluid than it ought to be, or had its crassamentum very soft; had, at the three last times of being taken away, the coagulum surrounded with a serum, which was of a white colour, as if from chyle being mix'd with it. Which I should not have taken notice of, if I had seen it in a person who was well-nourish'd; as I have at other times, and at a certain hour after taking food.

But in the following month, the blood which was taken away from another young man also, on the third, and again on the fifth, day of the disease, show'd at both times a whitish serum, in small quantity indeed, and even in all only a few drops on the third day; while the crassamentum was hard, and cover'd over with a crust of a moderate thickness: whereas on the fifth day, the coagulum was softer than it ought to be, and cover'd over with a crust not less thick than itself; not being hard however, but so tenacious, and resisting division, that you could scarcely cut it with a knife. Yet this second young man labour'd under a fever, which rather inclin'd to malignity, than was really malignant; being not only much shorter than that former, but more slight, and without danger. However, in those malignant fevers wherein these sandy particles appear'd, I neither saw a whitish serum nor a very soft crassamentum; but even this last sometimes more hard than it naturally is; and I even saw it very hard in one person, in whom it us'd to be very soft at other times.

I remember besides, that when two physicians of this college, of whom I was one, were consulted by order of the supreme magistrate of Venice, upon pestilential fevers that rag'd in that part of the territories of Padua which is about Montaneana, (for so some call it now, though Peter Bembo (*b*) call'd it Montanium) we were inform'd, that although in the beginning the blood of the patients was, for the most part, dissolv'd in too great a degree, and at that time appear'd to be too much coagulated; yet, in both times of that constitution, the petechiæ had discover'd themselves; and even at this time, if any persons happen'd to have the blood dissolv'd, these had the petechiæ produc'd in the same manner as the others: so that it was natural to conceive of this malignant power, (which the communication of the disorder by contagion show'd to consist in a very small quantity of subtle matter) since it operated in one and the same constitution of air at the same place and time, as being in fact one and the same; but that the blood being in a different disposition or state in different persons, appear'd to be differently vitiated in different persons.

(*b*) *Rerum Venetar. Histor.* l. 9. & l. 10.

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And as the evident vitiated state of the blood was different in different persons, or brought on some symptoms differently in different persons; so it plainly appear'd, that either different remedies, or a different use of the same remedies, were requir'd in different cases; yet that there were both some symptoms, and some remedies, which were common to all, although the former were much more known than the latter: for who would believe that he could, in any measure, conjecture the peculiar nature of that malignant power, or energy, by which every one was infected, except from those things that were observ'd to be commonly advantageous or hurtful to all? And even if these fevers were not altogether pestilential, could any one think here, with a celebrated writer in the medical science, that the strength of the patients was not overwhelm'd by the malignant influence, but by the quantity of blood, since such causes had preceded as tend to diminish rather than increase it; and experiments, which had been more than sufficiently repeated, show'd blood-letting to be pernicious.

23. It is, therefore, natural to suppose, that with the malignant power is join'd a solution or coagulation of the blood; but that the malignity does not consist in either of these qualities, especially as we see one or the other of them in so many disorders which are not malignant. However, where either the one or the other is very considerable, and has symptoms join'd to it by which the malignity is shown; as, in particular, a speedy and very great prostration of strength and vital power, which can neither be attributed to evident foregoing causes, nor to an excessive quantity of overwhelming blood; this quality also, as one that is very frequently join'd with malignity, and adds violent symptoms likewise thereto, will, in some measure, be a proof of this malignity; as you will find in many observations, and even in that which I shall subjoin from our Mediavia.

24. A woman, of fifty years of age, being very evidently seiz'd with a malignant fever, was brought into the hospital. Her pulse on the six first days was very small and obscure, though it seem'd afterwards to be a little more lively. But a very great streightness in respiration, and a palpitation of the heart, coming on, the woman was carried off thereby within the space of two days.

The thorax, therefore, only being open'd, the blood was found to be half-concreted in the left ventricle of the heart; and in the right, it was not only so collected together as to distend that cavity, but the whole of it was so crowded together into a polypous concretion, that although this seem'd to be fleshy, when you look'd at it, it nevertheless resisted the knife when you attempted to cut it, in the same manner as the most tenacious and viscid crust that gathers upon the blood of pleuritic patients.

25. If you happen to ask me whether acids, as the same persons imagine, bring on the cause of concretion, or, as is more commonly said, of coagulation, in the blood; or whether, although some acids bring it on, all of them are capable of bringing it on, as it seems to others they are not, or of continuing to produce it; I shall say, that there may be other causes besides acids from whence the blood may coagulate, and shall, at the same time, add some of my observations, which were made with attention, and close inspection, upon the blood that had been taken from patients by venæsection.

And,

And, first, although I have lit, more than once, upon blood which exhal'd a kind of nauseous and acid odour, and, if I may so speak, a kind of vague acid, or *acidum sylvestre*; it never happen'd, though I have been oblig'd to let blood in many malignant disorders, that I found any thing of an acid odour in that blood. But I found it in a woman who was affected with a continual summer-fever, and in a man in like manner, and in a boy of six years old, who were troubled with vernal intermittent tertians, of a mild nature like the former, in different years, in all of whom, for some reason or other, it was necessary to open a vein.

In the boy, indeed, the crassamentum was hard, and had very little serum: it was moderately firm in that woman and in the man; and in the latter with rather a little serum, and that of a yellowish colour. In which man it happen'd, that, though I had observ'd this odour on the fourth hour after blood-letting, seven hours after that I could scarcely perceive it; which was a pretty clear proof, that the cause of this consisted in particles which were more easily dissipable than in the blood of the others, in which I perceiv'd it after ten or twelve hours in a strong and vigorous state. And not only in those of whom I have spoken: for even where there was no fever, as in a severe and recurrent pain of the head, and in a scabies in like manner, there was the same odour of the blood, which abounded with a great quantity of serum around the crassamentum, that was cover'd with a thin and tenacious crust. In him, however, who had the pain in his head, the crassamentum was not so thick and black as in the scabious man; although both of them were scabious. But lest you imagine that in all those who are troubl'd with a scabies the blood emits an acid odour, I can assure you that it did not in others, and particularly not in a nobleman of the first rank, in whom a scaly disorder, that had eroded the skin, was unadvisedly repell'd at that time, from which he suffer'd much, his blood having a very tender and diffuent crassamentum beneath a very tough and thick crust. And, indeed, in the case of that same scabious patient whom I mention'd in the second place, although he had blood taken away four times within five months, no acid odour proceeded therefrom more than once.

But let us now say no more of a disorder of the blood of this kind, which is, as you see, not very rare, in order to consider one much more rare, which was perceiv'd at Padua ten years ago, and not by the faculty of smelling, but of feeling.

26. Catherine B. the honest wife of her honest husband Joseph, being a woman of a middle stature, and of a sanguineous temperament, so that her menstrua had begun when she was in her thirteenth year, and not in a small quantity, and continu'd to flow in the same or in a larger quantity every month after, even when she gave suck, and generated a great quantity of milk after her first and second time of child-bearing; for she brought forth twice; and notwithstanding she labour'd under an inflammatory fever every year afterwards, both in spring and autumn, and that for twelve years together; although she often lost blood on account of this fever; and even though the first of these fevers was succeeded by so great a hæmorrhage from the uterus, that being carried on beyond the eleventh day, it brought on a great weakness of the pulse, that was also follow'd by a jaundice, which was

at length carried off after two months by a great discharge of urine: this woman, then; whose habit of body and general diseases I have mention'd thus far, and am about to mention those that follow'd, for the reasons which I shall hint at when I have finish'd the narration; being in her nine-and-twentieth year, receiv'd the sudden and unexpected news of a fatal accident having happen'd to her most dear brother; and though she was in other respects of a fierce and intrepid mind, she immediately swoon'd away.

On coming to herself again, she perceiv'd that her menstrua, which she happen'd to have at that time, had been check'd; but on the next day she saw them again, not having the same appearance as before however, but being like water in which fresh meat has been wash'd: and discharges of this kind return'd at stated times afterwards, through the course of some months. For this reason blood was taken away more than once, and soon after often, in a very violent fever that came on, and was at length carried off by a sweat. However, after these things the menstrua return'd to their former nature; nor was a double tertian continual fever, which return'd every year in the spring-time, and that for the space of ten years successively, any obstruction thereto, notwithstanding this fever was not carried off but by repeated blood-letting, and the exhibition of the Peruvian bark.

After these ten years, she was attack'd in the summer with fevers almost of the same kind; but with these she was afflicted more severely and more dangerously, because they had violent pains of the whole belly join'd to them, and a uterine hæmorrhage, which was, for the most part, more increas'd when the pains were grown a little milder. Every method was made use of to counteract these symptoms, and, among others, blood-letting was six times repeated; and the serum of the blood was of a saffron colour, the crassamentum hard, and cover'd over with a polypous crust. But although both the fever and those symptoms were sometimes diminish'd, and sometimes, to all appearance, remov'd; yet an end was not put to them all, but by the *hæmorrhagia uteri* itself, which return'd in a greater quantity than ever on the forty-fifth day after the fevers had begun. Nevertheless, the patient soon grew well, and grew well in such a manner, that, after the completion of five-and-thirty days from the last hæmorrhage, the menses returning in a moderate and natural degree, and always continuing to flow at the proper time, she pass'd twenty months in extremely good health. But after that, in the summer of the year 1749, she had frequently, by reason of a great thirst, drunk a considerable quantity of water, without any uneasiness of the stomach, which she could by no means bear in former years, even when she had a fever; and in the autumn that follow'd, by reason of external causes which were very evident, and affected the body with fatigues, and the mind with anxiety, had been troubl'd with a nausea of the stomach, watchings, pain of the head, and lassitude; this symptom was added in the succeeding winter, that though her thorax and head were very hot, the belly and the lower limbs were cold, nor could be sufficiently defended from the cold by clothes, or any other preservative whatever; and, in like manner, that she was seiz'd with a horror, which crept over her back after dinner, and still more in the night-time, when she turn'd herself from one side to the other: and, indeed, if she got any sleep, she was awak'd by tremors and sudden terrors; although
some

some diurnal terrors were not wanting, which, certainly, were the consequences of a false imagination, through the effect of which she every-now-and-then fell into a swoon.

From hence all the symptoms last spoken of were increas'd every day, a sense of internal oppression was troublesome to her, and her head in particular became so heavy and subject to a vertigo, that the woman had need of a support in order to prevent her from falling. She was then in her three-and-fortieth year, when she sent for her physician, who was our Mediavia, and had been now for four years; and to him, on the seventh of May, in the year 1750, related all these things; and this, moreover, which in a woman of that kind is worthy of peculiar remark: that her menstrua, which, as we learn from what has been said above, had always been in a great quantity, and which in the last summer had not been diminish'd, although they flow'd twice in each month, and us'd to be pretty hot, and even extremely hot, had now not only begun to be diminish'd in their quantity, from the time she had been thus affected, but had begun to be discharg'd in a cold state, and, last of all, had even come away quite cold.

Upon hearing this account, the intestines, which in this patient had always been subject to costiveness, being immediately open'd in a mild manner, blood-letting was order'd; but the blood running down the arm slowly, and not coming forth with an impetus, a circumstance which gave rise to this my prolix narration, was observ'd by the patient, and at the same time by the surgeon, who was a man of approv'd credit and veracity, Daniel Fasolati, to the great astonishment of them both; I mean, that the blood, the violent heat of which not only the patient herself at other times, but the surgeons, when holding in their hands the glass-vessel in which the blood was receiv'd, had been surpriz'd at, came forth now in such a state of coldness, that the patient complain'd of ice (for that was her expression) flowing down upon the bending of her elbow; and the hand of the surgeon was affected with the coldness. The serum of this blood was in small quantity, and of a yellow colour; the crassamentum black and viscid. And that which in the evening was taken from the foot, had the same kind of coldness, and almost the same nature.

As there was scarcely any advantage gain'd by this treatment, and by some medicines which are call'd cardiacs; the physician did not hesitate, and particularly in a woman of this kind, in order that the blood might be rous'd to a more brisk motion, to take some from the arm and from the foot at the same time, on the following day. And the success corresponded to his wishes. For not only the blood was discharg'd in a less cold state, but while it was discharg'd the woman said that the sense of oppression was taken away; and a little fever coming on in the evening, in the night the inferior parts, which had always been cold and stiff in the preceding months, grew a little warm; and in the morning the fever remitted, and soon after left the patient entirely. After this she continu'd well ten days: the lower limbs being warm, and the pulse, which had been before hard, small, and low, and gave no resistance to the compression of the finger, being now chang'd for the better, in consequence of the oppression being remov'd; and the urine itself,

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which had been before discharg'd, not only in a large quantity, but in a crude and limpid state, returning now almost to its natural quantity and colour.

27. Now take the remainder of the narration ; for I do not think it sufficient to have related what had preceded and accompanied an affection of the blood of that kind, except all things be taken notice of, or, at least, down to a certain time. At the end of the tenth day, then, that part of the metatarsus of the left foot which answers to the great toe, was attack'd with a pain that was of very short continuance indeed ; so that, as it attack'd her once on the first day, and thirteen times on the following day, it recurr'd five times within half an hour, and went off in such a manner, that, a little after, on the very same day, the woman could go from home almost without any inconvenience ; except that, as she was returning, she fell down suddenly, without any external cause, on the right side, and did not rise up without being assisted by the hands of other persons.

She, nevertheless, return'd home ; and there the pain attack'd her, first, in a slight manner ; but on the day following was so acute, together with a great fever, and so continual, as to trouble her the whole of that day, and not to go off without the administration of opium. On the next day she was free both from pain and fever, so as to rise up from her bed in a good state of health. But on the succeeding day, she was seiz'd with a violent convulsion of the chest and of the thorax. After that, she was afflicted with a fever and pain, to which a very violent convulsion was added ; these symptoms growing milder sometimes, even to the space of three days ; but, at other times, persevering, or growing stronger, in such a manner, that it was scarcely in her power to draw her breath, and, finally, that her head was oppress'd by a deep sleep.

From the time of that first convulsion the disease was contended with, for eleven days, at one time, by giving the fresh-drawn oil of sweet almonds ; at other times by antispasmodic powders, of the same kind as those that have their name from the marquis ; sometimes by cinnabar ; sometimes by opium, which in the middle course of the disorder was left off, as it had been found to be of no effect when given to the quantity of two grains ; and often by venæsection, that is to say, once in the arm, twice in the hand, three times in the foot ; the last blood that was taken from thence having almost taken away both that sleep and convulsion, leaving the fever behind : and this fever discover'd itself every morning by a thirst, and was attended with a pain of the head and stomach, till it reach'd to its achme ; these symptoms afterwards ceasing, and the fever itself remitting to such a degree, that in the evening scarcely any was left, and the patient slept well in the night. And after this fever had continu'd some days in the same manner, it was quite remov'd by the Peruvian bark, taken to the quantity of an ounce, divided into several doses. Three years were pass'd over from this time without any inconvenience that was worthy of remark. But afterwards, the pains, fevers, convulsions, and other symptoms of that kind, return'd, though always slighter than the former, and more easily giving way to large blood-lettings.

And to these things, which had now been committed to writing a long time before, I thought proper to add the following, which I receiv'd by strict enquiries

enquiries from the same woman, about the beginning of the year 1760, when these letters were copied: That, in the year 1758, which was the fifty-first of her age, she at length began to be without her menses, which to that time had continu'd to flow, not only very plentifully, but of a bright-red colour: nevertheless, that she had been very well, and was still so, except that she had an almost continual sensation of ice, as it were, in her belly; and as this ascended from thence to the chest, it brought on such a difficulty of respiration, that she was immediately oblig'd to lose blood, and that to a considerable quantity. Nor is strength wanting to bear this, as the woman still preserves both a good habit of body, and a good colour of countenance.

28. You have here the whole history of an affection of the blood, which is not less to be wonder'd at than what you read in Lower (*c*), of this fluid being almost wholly effus'd by a very great hæmorrhage, and at the same time restor'd by taking plentifully of broths now and then, and at length being discharg'd in a state more similar to broth than to blood; the man not only living, but perfectly recovering: you have, I say, the whole history, from the medical journal of our Mediavia, given in a prolix manner indeed by me, but, as I apprehend, not without some utility; since in proportion as things of this kind are more difficult to be explain'd, we ought to endeavour so much the more that no part of the history be unsupplied to those who may undertake to explain it, contrary to what is generally the case in other observations of this kind that I have hitherto lit on.

For, to omit what our Spigelius (*d*) has said "of thick and cold blood," which he saw coming forth from a vein that was open'd in persons who had drunk cold water after being very hot, and not without difficulty, as he seems to suppose it to have been made more dense and thick, within the adjacent great artery, from the cold of the œsophagus, rather than to have been actually cold; certainly the observation which was formerly propos'd in Riverius (*e*), of a woman very liable to anger, who died within the fifth day after blood-letting, we are so far from knowing what causes had preceded, or what symptoms accompanied that continual fever under which she then labour'd, that Thomas Bartholin (*f*) was oblig'd to conjecture by a kind of divination, if I may be allow'd so to speak, that a perpetual horror had accompanied this fever.

As to Peter Borelli (*g*), he thought it sufficient to say, that a commander of horse, "when he had a vein open'd in a disease, had discharg'd his blood "in a cold state:" so that we are not even told under what disease he labour'd, or who had been witness to the circumstance. And he likewise adds such an explication of the phenomenon, that makes it seem surprizing, not that the same circumstance had already happen'd sometimes, but, rather, that it does not happen always, or much more frequently at least. Finally, Gabriel Clauderus (*h*), producing another explication, according to which this circumstance ought to happen always or generally, in the most violent apoplexies, says that he had observ'd the same thing as Riverius; that is, he had observ'd, in two matrons who were seiz'd with a violent apoplectic pa-

(*c*) Tract. de Corde, c. 2.¹

(*d*) De h. m. corp. fabr. l. 6. c. 2.

(*e*) Obsc. communic. 46.

(*f*) Cent. 4. Epist. Med. 47.

(*g*) Cent. 2. Med. Phys. Obs. 51.

(*h*) Eph. N. C. Dec. 2. A. 4. Obs. 138.

roxyfm, the blood, which flow'd from a vein that was open'd, to be cold, he having felt it so in his hand immediately upon its being discharg'd; yet that he had restor'd both of them to health, by applying, externally and internally, medicines that were loaded with volatile particles.

But from the vein of our woman the blood did not leap forth, but flow'd down slowly; so that Clauderus might have accommodated his explication, such as it is, with somewhat more ease to this woman. The same author subjoins (i) observations of the blood dropping from the nostrils in a cold state, and of the urine being discharg'd in the same state of coldness. But if it had happen'd that he had written later, he might have added others, not only of the urine being discharg'd in a frigid state; as, for instance, by a soldier (k), and by a boy (l), both of whom were oppress'd with a malignant fever, the latter, moreover, being universally cold; and also of a foetus being discharg'd in a cold state, not only when already dead, and from a mother who was already cold, and who died soon after, that is, within an hour (m); but also of a living foetus (n), and from a mother who liv'd, having "the most intense coldness" in its whole little body, and "a rigidity which was quite unusual, and almost like that of wood;" so that from its birth to the end of three days, during which time it liv'd, if it had not breath'd in the slightest degree imaginable, it would have been consider'd by every one as a foetus quite dead.

Nor would Clauderus have omitted the example of that illustrious woman (o), in whom, "for some days before death, the expiration had always been extremely cold;" and after she was dead, though both lobes of the lungs had "scirrhi and vomicae in great plenty," the left was found to be "excessively cold to the touch, and like ice; yet such a coldness as this was not observ'd in the other lobe of the lungs, nor in any other part of the body." But we will set aside the consideration of those that were dead, or near to death, and will compare with our woman, who was herself preserv'd, those only that it was in the power of Clauderus to save, notwithstanding cold blood distill'd from the nostrils, or cold urine was discharg'd. And there is no doubt but in our patient the menses had been discharg'd in a cold state; although there is a considerable difference betwixt the blood which flows immediately from an open'd vein, and that which falls out by drops into the cavities of the nostrils, or uterus, and vagina; and at length betwixt the blood immediately flowing from a vein, and a fluid which, after being secreted from the blood, flows down through a very long passage: so that it is somewhat less difficult to understand how these discharges could come away in a cold state, than how the blood could be cold in a vein.

If the upper parts of the body had been cold in our patient, at that time, also, as well as the lower; it would, perhaps, have come into the mind of some person to reply, that, as the remaining part of the blood which flow'd through the internal parts of the viscera was, by this means, sufficiently warm and proper for the preservation of life, that only which was carried through the external veins, and lay immediately under the skin, could be cool'd by

(i) Ibid. Obs. 139, & 140.

(k) Earund. Dec. 3. A. 9. & 10. Obs. 206.

(l) Act. N. C. Tom. 1. Obs. 34.

(m) Eph. N. C. Dec. 3. A. 5, & 6. Obs. 80.

(n) Earund. Cent. 9. Obs. 30.

(o) Commenc. Litter. A. 1743, Heb. 21. n. 4.

the coldness of the skin. But there is no room here for this explication, whatever its consistency may be in other respects. For not only the upper parts were hot, but the woman would not have complain'd of the coldness of the blood which flow'd down, unless the skin had been less cold.

You then, as you are an ingenious enquirer, will consider by what means it can happen, not only that the blood may sometimes be such as it is in fishes, but colder in living men, and men who are likely to live. But I, for whom it is sufficient to have given you the history, with very great fidelity, and to have compar'd it with others, must go on to other things, which, although they are not of so surprizing a nature, this history has, nevertheless, brought back to my remembrance.

29. When I resided at Bologna, a certain honest man was every day seiz'd with a coldness, which, although no heat follow'd it, one out of two physicians consider'd as a fever; and the other, because the patient fell down when seiz'd with that coldness, chose rather to consider in the light of a vertiginous disorder. He was cur'd by the use of the *carduus benedictus*, and the *spiritus salis ammoniaci*.

I also remember that a woman, who was fifty years of age, and was taken into that hospital of St. Mary de Morte, was seiz'd every night at a certain hour, with a coldness and trembling, which continu'd till the morning, being attended with a pulse which was somewhat more obscure than usual, but not more frequent, nor with any other inconvenience, nor yet follow'd by a febrile heat. And indeed her feet were continually cold, and often at other, though uncertain, hours, she was likewise seiz'd with a short coldness, trembling, and obscurity of pulse. The disease having been in this state already for twenty days; by giving the Peruvian bark those erratic rigors first of all disappear'd, and the periodical remitted: at length the latter ceas'd to return also, and left the woman quite free from disease.

But these symptoms seem'd to me in fact to belong to a fever *sui generis*. Other tremors, however, which were very similar to febrile tremors, but not join'd with coldness, and still less succeeded by any heat, and which I know to have attack'd a nobleman, a fellow-citizen of mine, every other night, I have referr'd to another place, and saw them remov'd, by a considerable quantity of urine being discharg'd spontaneously, and by a considerable discharge from the intestines, by the help of a mild medicine, without the use of this bark: although that some periodical affections, if they are febrile, are often dissipated without this remedy, nobody is ignorant; and if they are not febrile, are sometimes overcome thereby, as has been remark'd by many.

30. But that by the use of this bark (if you except some constitutions wherein it has seem'd not to answer so well) periodical fevers are put to flight with much greater certainty, if it be taken in the quantity, and at the time, that is proper, whether they intermit, or are already, from intermittents, become continual, and whether they are mild, or malignant and pernicious, I suppose is now well known, almost among all persons; since even some of the physicians of this country, whom formerly fear, and I know not what kind of aversion to the bark, deterr'd from the use of it, might have been brought into a better opinion thereof, by the many happy and speedy cures which

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which they have seen perform'd even by me, with the assistance thereof, many years ago; and those also upon persons of rank and figure.

But the notice of the proper time, in which this remedy ought to be exhibited, may sometimes escape the physicians, not so much from their carelessness in foreseeing the danger at hand, as by chance; in the same manner that it happen'd in his eminence the cardinal Giovanni Francesco Barbadici, whom the most pernicious febrile paroxysm almost carried off, before it could be known that he was attack'd with a periodical fever.

The case is, of itself, certainly worthy of observation, and not only because it happen'd in a man of eminence, whose last disorder I have already describ'd to you (*p*). For having shut himself into his chamber immediately after dinner, and not open'd the door at the usual hour; the servants at first suspecting nothing, except that he was detain'd, longer than usual, by his holy prayers and meditations, or by reading, were quite unalarm'd; but afterwards, when it began to grow late, they suspecting some disorder, at first knock'd at the door gently, and after that, as nobody answer'd, more strongly, but all to no purpose, though they call'd out to him at the same time; at length, getting in at the window, they found their master lying speechless, without sense, and without motion. A physician being immediately call'd, he found, besides these disorders, which however remitted more and more, convulsive startings of the tendons. and a fever. And this fever alone continu'd, all the others having gone off of themselves, within less than an hour.

The following day, in the morning, Vallisneri and I were call'd to the patient. We enquir'd of what nature, and from what cause, that very sudden, and very violent, disorder of yesterday had been; which a fever, as it seem'd, had carried off. The physician told us, that not many days ago, an erysipelas had appear'd in the patient's face. But that, probably, from the inclemencies of the air; for it was then the autumn of the year 1729, and the patient being more solicitous about his episcopal duties, than about his own health, would never confine himself to bed, nor keep himself within his chamber; it had been repell'd inwardly, and had suddenly disappear'd. That he had seen only the termination of yesterday's disorder: and as to the manner of its attack, this even the patient himself did not know, as he had neither been sensible what had then happen'd to him, in those many hours, nor remember'd any thing now, except that feeling himself cold, as if from the season, he had gone to bed. The same things were confirm'd by the patient, whom we found, as usual, in a chearful and attentive state of mind, his fever now growing slighter and slighter, and there not being the least trace of the symptoms he had undergone the day before. Although we doubted, for more reasons than one, to what disorder we should, with propriety, refer these symptoms; yet that something monstrous was cherish'd within, not only the aphorism of Hippocrates (*q*), but reason itself also, did not suffer us to doubt.

In compliance with the one and the other, therefore, until some more clear

(*p*) Epist. 13. n. 3.

(*q*) 25. Sect. 6.

light should be thrown on the case, we readily granted, and assented to, the first physician's opinion, who was a man of eminence, and beyond a doubt experienc'd; I mean, that the matter of the erysipelas ought to be again thrown outwards, in order to prevent its bringing on the same danger afresh, which it seem'd to have brought on before; and this the physician had already attempted, by giving such things as might propel the matter to the skin, without exciting any tumult in the constitution, and had made nature obedient to him so far, that a nocturnal sweat, and some moisture of the skin, at present, were the consequences. And, indeed, in the whole of that day, there was nothing new that we could observe. But on the succeeding night, behold a febrile paroxysm came on, which however, except some convulsive startings of the tendons, show'd nothing violent till noon. At which time, at length, either the same, or rather another accession, produc'd such a number of dreadful symptoms, that we were all sent for immediately. We found the patient incapable of speaking, and totally insensible, having a stertor, and a very difficult respiration, and being altogether like an apoplectic person, except that he was continually agitated by a *subfultus tendinum*, and had a very obscure pulse, which gave no resistance to the finger, when press'd upon it.

Then, indeed, it was evident with what disease he had been seiz'd three days before, and that this was another accession of a most dangerous tertian fever, which, as it answer'd to that first paroxysm in the hour of its return, corresponded also therewith in its violence, and in the number of its symptoms, or, indeed, rather outstripp'd it. Nor was there any hope of retarding the threatening danger, by what we could then apply only to the external parts, as all the terrible symptoms which we just now mention'd, grew stronger and stronger, before our eyes, and under our hands; so that, of all those who saw the patient, and a great number of persons did see him, there was not one who did not look upon it as certain, and pronounce it through the whole city, which was struck with the unexpected disorder of their excellent pastor, that he would very soon die.

And although I was very much under the same apprehension; I, nevertheless, said that some little hope remain'd, if this accession, like the former, should remit, if not at the same hour, by reason of its greater violence, at least an hour or two later. I therefore enquir'd of my fellow-physicians, who departed about evening, as from a person that they totally despair'd of, whether, if the disorder should remit, they could suppose there was any objection to my giving the Peruvian bark; to which they answer'd that they should readily assent, provided no blood should, in the mean while, have begun to adhere obstinately, either in the brain, or the lungs.

Within the first hours of the night I perceiv'd that the pulse, by degrees, became not quite so bad; and that some sweat appear'd: after that I found the patient come to himself by very slow degrees; and within that night, on which I would not return home, all the dangerous symptoms totally vanish'd: so that, early in the morning, the power of swallowing being restor'd, and the fever being brought to a proper remission, there was now room for a remedy. And this I had previously order'd to be prepar'd, as I always do in very violent cases of that kind, agreeably to the practice of the

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most eminent physicians, from the same bark; yet not such as the appearance of, only, recommended to the senses by a mark that is sometimes fallacious; but such as it was certain intermittent fevers had been put to flight by the use of; and I gave half an ounce of it in the first draught: the remainder, which was three times the quantity, I distributed into much less parts; to be taken at proper intervals. And by this means I obtain'd my purpose of preventing the return of the paroxysm; which would, without doubt, have carried off the patient; who was almost killed by the second.

But even the second would never have come on, if it had come into my mind to do the same thing in the remission of the first. This, however, did not come into my mind; as we consider'd only the erysipelatous matter being thrown inwards, as it certainly was; and not the fever: for who could have guess'd that this fever had not follow'd those very violent disorders, as generally happens; but had preceded, and brought them on, and was periodical? as no one had seen the beginning of it; nor any fever of this kind had been observ'd at Padua at that time; although in those days, as we afterwards learn'd, the same fever had been observ'd in a city not very distant, and had carried off an illustrious patient, in whom the use of the bark had been deferr'd for a fit or two. Wherefore you, for whose sake I have given this long narration, if a case of that kind happen to you at any time, the beginning of which is unknown, although the cause may seem to be manifest; will by no means suffer yourself to omit enquiries into the nature of the fevers which prevail at that time; for it will not always happen to you, as it did to us, that it will be in your power to cure the patient, in whom you have let slip the remission of so dangerous a paroxysm.

31. Nor would I have you suppose that the patient, if he be not an old man, will be free from a fever of this kind, because learned men have now thought proper to call it "the soporific intermittent fever of old men." For although it happens more frequently in that age, and the cardinal, of whom we have been just now speaking, was more than seventy years of age; as also the noble count M. Antonio Trento, whom I had cur'd by the same remedy, when in the same state of danger from a like fever five years before; and that without either of them, which is not so common, relapsing into the fever: yet Morton (r) has also describ'd the case of a boy of ten years of age; and Forti (s) of a girl of a tender age; not to mention another who was not perfectly grown up to womanhood, and who labour'd under fevers which he call'd "lethargic."

I likewise would not have you be without fear of a soporific disorder coming on in the future paroxysms, or future parts of the paroxysm, because patients have pass'd through the first paroxysms, or the first part of any paroxysm, without that profound sleep. For although it frequently comes on before; and indeed long before, yet it now and then comes on at length in the seventh paroxysm: and although it is in the first attack of the paroxysm

(r) Pyretolog. Exerc. 1. c. 9. Hist. 25.

(s) Therapeut. Special. ad febr. period. per-
nic. l. 4. c. 3. Hist. 9. & 1.

that it generally comes on, as Sydenham also (*1*) shows; and that time, according to the dissections made by Harvey (*2*) of those who died in the beginning of the fit, is very convenient for the obstruction of the blood: there are not wanting; nevertheless, examples of a deep sleep coming on, not only at other times of the paroxysm, which is not uncommon; but what is very rare, when the fever is declining; one of which kind you will see taken notice of in the *Commercium Litterarium* (*3*).

Here you will, perhaps, wish for some marks, whereby to judge, while the fever does not seem to differ from the mild kind, that this dangerous symptom is about to come on. And the same thing has been wish'd by others, no less than to know, whether any one had observ'd fevers of this kind before the year 1731. And they might easily have both their wishes fully completed, by the reading even of one author whom I have quoted; I mean Torti. For as he had transferr'd what was written before the end of the sixteenth century by Ludovicus Mercatus; and again before the end of the seventeenth century by Richard Morton, upon dangerous intermittent fevers, into his celebrated *Therapeutice* (*4*), not without the addition of scholia; he has handled the subject in such a manner, as to inform every one who reads his works, that Hippocrates, and many of the ancients, were not ignorant of intermittent fevers being sometimes made malignant and destructive (*5*); and, at the same time, from what signs Mercatus has, in general, taught us to understand that these will be of a dangerous kind (*6*); but particularly to fear in those whereof we speak; lest, "in the third or fourth accession, a deep sleep, or some other of the soporific affections, become perfectly essential to the fever (*7*)."

Nor, indeed, ought those signs to be pass'd by which Torti has propos'd, both in general and particular, from his own observation (*8*); and has confirm'd by the production of histories, in their proper places, which relate not only to other kinds (*9*), but also to this we treat of now (*10*).

To these you will join the signs that are added by another illustrious physician in relation to this very kind (*11*). And you will see in Torti (*12*) this mark, among others, of a sleep being about to come on soon, that the patient sometimes stammers, and mutilates or clips his words, or speaks one for another, "just as if he was troubl'd with a slight apoplexy degenerating into a palsy of the tongue." There is, also, in the same author, the history of an old woman (*13*), in whom, as it had happen'd, in an exacerbation of a fever, not only that she could not speak her words properly, but that an evident kind of distortion of the mouth had come on; in the following exacerbation a deep sleep, moreover, was added; and in the next to that an apoplexy, which pass'd over-into a paralysis of the whole right side. And, that

(1) *Epist. Responf. de Morb. Epidem.*

(2) *Exercit. 1. de Mot. cord. & sangu. c. 16.*

(3) *A. 1740. Hebd. 13. n. 2.*

(4) *L. 2.*

(5) *Ibid. c. 4. Schol. 1. & c. 8. Schol. 1.*

(6) *Ibid. c. 2. ante Schol. 3.*

(7) *Ibid. c. 3. ante Schol. 3.*

(8) *L. 3. c. 1.*

(9) *L. 4. c. 1. & 2.*

(10) *Ibid. c. 3.*

(11) *Vid. Comm. Litter. A. 1733. Hebd:*

(12) *L. 3. c. 1.*

(13) *L. 4. c. 4.*

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you may know these to have been from a fever, they were taken off by the use of the Peruvian bark.

You not only perceive what symptoms have sometimes foretold sleep, and after this an apoplexy; but you, at the same time, perceive, that this sleep is rather of the apoplectic, than of the lethargic kind, especially when join'd with that stertor which is wont to be join'd with the most violent apoplexy. And in consideration of these things, Sydenham (*i*), and others, have asserred an attack of this kind, to be "altogether like a true apoplexy;" and Torti himself (*k*), that it at length becomes fatal, "like a strong apoplexy," if not put a stop to by the bark; and Morton (*l*) says, that a boy, whom we have taken notice of above, was found twice by him "affected with a stertor" and other symptoms of a true apoplexy:" and he has related, that an old man, an uncle of his (*m*), who had been already, for many years, dull and sleepy, was seiz'd with an "apoplexy" of the same kind; so that the attack remitting, he sav'd both of them by giving the bark in large doses.

But the calling to mind this dull, sleepy, and moreover, fat old man, join'd with other histories, and particularly with that which is describ'd in the *Commercium Litterarium* (*n*), by a diligent, certainly, and skilful observer; I mean, of an old woman, who, having been afflicted a long time before with a stupor, and debility of one arm, and soon after with a heaviness of her head, a frequent vertigo, and a great lassitude of her legs, was seiz'd with a very profound sleep, in the paroxysms of an intermittent fever; these examples, I say, ought to make you solicitous lest, in intermitting fevers, which trouble patients that are subject to these, or any other similar disorders of the head or nerves, they should happen to be seiz'd with that terrible sleep, or even with an apoplexy, without that sleep having preceded.

For as examples are at hand, from the observator whom I have commend-ed (*o*), "of an incurable apoplexy," and "of an apoplexy suddenly fatal," which follow'd this sleep; so also we have others, wherein, "without any" "soporific affection having preceded," an apoplexy has snatch'd away those who were attack'd with intermittent fevers. Wherefore, when a patient shall be subject to those disorders of which we were speaking; take care that you give him, in particular, the bark, as you would another, and in time; and take care likewise, that it may be retain'd by him for a proper time; for he whom I have spoken of, as being suddenly kill'd by an apoplexy, could by no means retain it. And this I was the more anxious about in Count Trento, who was affected with a kind of apoplectic sleep, as has been said, and, at the same time, with a slippery state of the bowels, because I knew very well that his own brother had been carried off, in former years, by a sudden apoplexy. But in the remission of the paroxysm, I endeavour'd that the bark should be retain'd, by mixing with it such things as strengthen the stomach and bowels; for I was afraid to make use even of the least opium. And in this manner it pleas'd heaven to prosper my wishes.

32. I do not think you will be displeas'd, and I know for a certainty you

(*i*) Epist. Cit.

(*k*) l. 3. c. 1.

(*n*) A. 1738. Hebd. 33.

(*l*) Hist. 25. cit.

(*o*) *Commerc. Litter. A.* 1731. Specim. 24.

(*m*) Hist. 26.

n. 3. & A. 1734. Hebd. 13 post n. 2.

will not be surpriz'd, that instead of anatomical observations on those who died of these fevers, I have produc'd observations made upon living bodies. For you know, not only that in the section which treats of fevers in the Sepulchretum, some histories of this other kind are produc'd (*p*), but that it is my custom particularly to avoid dangerous dissections. For which reason, I suppose, you will be in less expectation of dissections perform'd on those bodies which were carried off by malignant fevers attended with the small-pox, when you know that I have not, as yet, been seiz'd with the small-pox. For I have not so much courage as Theodore Zwinger, who, as you will even read in the Sepulchretum (*), had never labour'd under that disease, and yet dissected a boy who died of it.

But you will, perhaps, say, that the bodies even of those who die of the plague itself, when dissected, and especially when cold, have been denied to be hurtful even by very learned men. It is true, I have read these authors; yet I have also observ'd what Thomas Bartholin (*q*), and Isbrandus Diemerbroeck (*r*), who had read the same, have thought of it. For the first says, "I would not trust too much to their reasonings;" and the other, that a dead body, when it is, in fact, quite cold, is "much less contagious than a living and morbid body;" but that it was contagious he did not deny; nay, even shew'd by his own example what he thought of it, when, although there was a person who promis'd to show him (*s*) carbuncles in the stomach of a body of that kind, he said, "That he did not care to disturb a wasp's nest, and, by opening the cavity of the abdomen, expose himself to the danger of contagion; and that he had rather believe it, than see it:" and again (*t*), when he had related that it was demonstrated by the surgeons in his presence, that the exanthemata were continu'd very deep through the muscles of the limbs, he says, "Whether the viscera are affected in the same manner, I have not ocular experience; for this reason, because, although I make but light of the contagion which arises from the dissection of the muscles, I, nevertheless, believe that the contagion which arises from the opening of the abdominal and thoracic cavities, may rush furiously upon the by-standers."

Do not be surpriz'd, then, that I chuse rather to be in the number of the many, than in the number of "the very few," as he says (*u*), "who give credit to those that assert the carcases of such as had been afflicted with pestilential disorders, not to be contagious." And if they had not been very few who gave credit to them, do you think that, after so many pestilences, there would have been so few observations from bodies that had died thereof, as are transferr'd into this section of the Sepulchretum? For they are very few indeed, if you take away those that are put down from hear-say, those which assert incredible things, and those that are repeated; as, for instance, that which, after being set down under the third article of the sixty-second observation, is also put down again under the seventh article. And

(*p*) Append. ad Obs. 10, & 29.

(*) In Additam. ad hanc Sect. Obs. 19: cum Schol.

(*q*) Censil. de Anat. Pract. n. 3.

(*r*) De Peste l. 2. c. 3. adnot. 12.

(*s*) Ibid. l. 4. Hist. 15.

(*t*) Hist. 32.

(*u*) Hist. cit. 15.

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lest you should suspect that anatomists have been deterr'd from these dissections by a vain fear, rather than by any just reasons ; pray read the arguments which are at the same time contrasted with the contrary ones, in the same authors, Bartholin (x) and Diemerbroeck (y).

Yet, if after reading them you are still of opinion that there is no danger to fear ; attend to what happen'd in this our theatre to those who dissected the bodies of persons who died of a malignant fever only, and not of a pestilential one, A *professor*, who was young, strong, and healthy, Stegaggoni by name, had so far dissected a man who died of a petechial fever, as it is call'd, as to prepare the muscles of the back, (trusting, perhaps, to Diemerbroeck, who made light of this) when he was seiz'd with the same fever, and taken from among the living. But this body might, perhaps, not be quite cold : that of an old woman, however, the belly of which was open'd by the celebrated Vulpius, in the year 1717, and in the month of January, was certainly cold both internally and externally ; for I stood by him, in order to demonstrate the situation of each viscus to the auditors ; and although no ill smell, more than usual, appear'd, nor any mark of disorder besides an entangl'd state of the intestines, yet I immediately felt a kind of unusual languor, just as if I were about to fall into a swoon : and soon after, when the demonstration was finish'd, we had scarcely return'd home, but we were both of us seiz'd, one in the same manner as the other, and at the same time, with a febrile horror and coldness, and after that with a febrile heat : and from that time, notwithstanding the force of the fever was broken, I began to have but indifferent health for some years, in the manner I have said in the dedication of the fourth of the *Adversaria*. Nor is this to be wonder'd at : for although that woman had been brought into the hospital as an apoplectic patient, and really was so ; yet that apoplexy had come on lately, during the course of a malignant fever under which she labour'd at home, as was found upon enquiry afterwards.

You see, then, that in order to avoid the danger, it is not sufficient to be cautious of dissecting a body before it is cold : for they who have recommended this caution do not seem to have observ'd, that a body may be cold externally, but retain its heat internally ; which, as you will perceive from my letters to you, happens very often ; and sometimes, even at the thirtieth hour after death (z), heat remains in the internal parts of the belly. Must we wait longer then ? A putrefying body, they say, becomes “ much more contagious than a living morbid body.” Nor would I have you object to me, that there have been, and still are those, who, without having regard to any of these cautions, have dissected such bodies with impunity. For the nature and force of all malignant fevers is not the same, nor the disposition of all dissecters the same ; and as no one can, for a certainty, know the nature of either, who can deny but the advice of the more timid is safer than that of the more bold ?

33. However, to return to myself, and to the small-pox : when I was a very young man, and this disorder happen'd to be very general, (and so mild as scarcely to have taken any off to that very day) being carried away

(x) N. 3. cit.

(y) Adnot. 12. cit.

(z) Epist. 3. n. 2.

with

with a desire of learning, I made no hesitation to attend an excellent physician in the hospital; and was not afraid even to feel the pulses of those who lay ill of the small-pox, much less to take notice of other circumstances, and enquire into still lighter matters; as, for instance, by what collyrium the skin upon the eye-lids, though in other parts almost universally rough and deform'd with pustules, was, nevertheless, kept smooth, clear, and beautiful; and I found that this collyrium was made of plantain water, in which a little of the saccharum saturni, as it is call'd, was dissolv'd. And while I was observing these things, it accidentally happen'd that one or two of these patients were carried off by death; though the physician very diligently did all in his power to prevent it.

Admonish'd by this instance, I determin'd never to attend patients of that kind afterwards, though sent for even to princes and men of the first rank. Nor do I think, though I have reach'd to this age, that I ought, by any means, knowingly to bring myself into danger; since I have known it happen, even to persons of eighty years of age, to be infected with the variolous contagion in the same manner as children, and to perish from thence much more easily than children, notwithstanding they had then believ'd themselves to be free from it; although in a very severe constitution of this kind at Forli, in the year 1749, an old woman, who was advanc'd beyond the age mention'd just now, and afflicted with that disease, escap'd with her life, which was certainly a rare instance of escape.

However, what it was not proper for me to do; I mean, to dissect the bodies of persons who died of that disease; has been done so many times, and by so many anatomists, that I cannot help being surpriz'd, men, in other respects very learned, should seem to be ignorant, that they would be wide of the truth, either who should contend that the variolous pustules never came in any other part but the skin, and particularly not in the intestines; or who should contend that they were always form'd in other parts.

You will naturally suppose, that the first class of these gentlemen had happen'd to light on such observations as that propos'd by Peyerus the son (a); and that the other lit on such as happen'd to agree with those which the celebrated Gunzius (b) takes notice of, as being made by himself; but that both, quite forgetful of all others, had concluded that every observation was similar to their own; whereas many which are even transferr'd into the Sepulchretum were extant, some of which very evidently agree with the former, and the others with the latter.

Besides, there are some, which you may collect from the dissertation of the celebrated Phil. Conr. Fabricius (c), to be added to both of them. And, moreover, as another dissertation (d), which was deliver'd under the auspices of Bufferius the president, will give you an observation made on a certain prince, which agrees with the first of the above; so the volumes of the Cæsarean Academy (e) will furnish you with many that agree with the latter.

(a) Obs. Anat. 2.

(b) In Hippocr. de Humorib. not. 21.

(c) Exhib. Obs. circa Constit. Epid. A. 1750.
xoi b ad § 19.

(d) Sist. Hist. morbi, & cadaver. variol.

c. 1.

(e) Eph. Dec. 3. A. 7, & 8. Obs. 97. u m
Schol. & Cent. 9. Obs. 52.

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And, indeed, other histories are not wanting, which describe pustules in various parts besides the skin, and yet not in the intestines or other viscera. Of which kind are those that you read in the *Acta Hafniensia* (*f*), in the Ephemerides of the Cæsarean Academy (*g*), in the pathological works of the most excellent Haller (*h*); and this, also, which I subjoin nearly in the same words wherein I formerly heard it from Jacob Sandri, who was one of my preceptors at the time when I resided at Bologna, and a man of great learning.

34. A boy, of a noble family, who had but few pustules of the small-pox externally, and had no signs of others having beset the viscera, died like a suffocated person.

The body being open'd by Sandri himself, shew'd all the viscera in a very sound state. But upon one of the muscles of the larynx a variolous pustule had been form'd, and about it the black colour of a gangrene now appear'd.

35. Moreover, that an internal gangrene is frequently join'd with other malignant fevers also; and even, if they are mortal, that inflammations of the viscera then degenerate into gangrenes; will appear from observations that you will read in this section of the Sepulchretum. To which you may also join these: Our Sanctorius (*i*) says, "Some others have thought that a malignant fever arises from a gangrene in the liver, or any other viscus; which I have observ'd in bodies more than once." Dominic Gagliardi (*k*) affirm'd, that in the dissections of those who perish'd from a malignant fever, in whom the ulcers which had been open'd by corroding medicines call'd vesicatories, already began themselves to be affected with a gangrene, "internal gangrenes were frequently seen." And Joseph Lanzoni (*l*), in describing an epidemical disease that rag'd at Ferrara in the year 1729, took notice, among other things, of "some livid spots in the coats of the intestines," which appear'd upon opening the bodies of several persons who had been carried off by this disease. And you yourself may add other examples which will not be wanting.

36. Now, before I make an end of writing, I will venture to say I do not suppose you will be surpriz'd; particularly as you were inform'd in the beginning, that I am not willing to repeat any thing which I have already written to you; I say, I do not suppose you will be surpriz'd that I have made no mention of some certain fevers in this place.

For you know that I have treated of the greater part of them, in treating of other disorders. Some however, as, for instance, quintans, and those that have longer intervals, I confess I have never nam'd; nor, indeed, have I seen any of them, except one which recurr'd exactly every week, in a nobleman, when I formerly liv'd at Bologna: nor can I say any thing of them, except that, although they generally succeed quartans, they are not, nevertheless, as has been done sometimes, to be consider'd as quartans that have their intervals render'd longer, unless we would still consider quartans, in like

(*f*) Tom. 1. P. 1. Obs. 109.

(*g*) Dec. 3. A. 7, & 8. Obs. 47.

(*h*) Obs. 44. in fine.

(*i*) Comment. in I. Fen. I. 1. Avic. Qu. 86.

(*k*) Dell'Infermo instruito P. 2. Vegl. 30.

(*l*) Act. N. C. Tom. 2. Obs. 209.

manner, when they succeed tertians, as tertians, whose returns are become slower than before; contrary to the opinion of all physicians from the most early times.

And this has been very clearly observ'd by my ingenious friend Zeviani (*m*), where he describes the change of a quartan into a quintan, of a quintan into a tertian, and soon after, of a tertian into a quartan, and, finally, of a quartan into a sextan; and this constant in a young girl that he had seen: of which last species of fever examples are extremely rare, as I do not remember ever to have read more than two besides this; the one of Gentilis (*n*), and the other of Lanzonus (*o*). But what appearances have been found in those who died after fevers of this kind, I am quite uninform'd. Yet when they are of long continuance, or succeed fevers of long continuance, it is probable that they leave behind them almost the same appearances as these generally do. And these fevers frequently produce disorders of the mesentery, or the spleen, or some other neighbouring viscus, and particularly of the liver. And you have an example in the celebrated Fantonus (*p*) of all these appearances being found at the same time.

In regard to the spleen, I have already sufficiently shown this, in more places than one, but particularly in the thirty-sixth letter (*q*), which you will find to agree with the observations transferr'd into this section of the Sepulchretum, where the question is of quartans (*r*), and of long erratic fevers (*s*). You will also find examples relating to the liver in the same place. With which you will join what is said, in the *Commercium Litterarium* (*t*), of the substance of the liver "cherishing the fomes of quartans in preference to "other parts;" and that, for this reason, "in many of those who die of "quartans, it is at one time found to be injur'd, at another time dried up, and sometimes inflated.

37. And thus far I had to add to the histories of Valsalva upon most kinds of fevers, from my own observation, those that I have read, or such as have been communicated to me by others. And these I would have you receive, as usual, in good part. Farewel.

(*m*) Nuovo Fonte di Pronostici P. 1.

(*n*) Apud Schenck. Obf. Med. l. 6. ubi de raris febr. typis Obf. 2.

(*o*) Eph. N. C. Cent. 8. Obf. 10.

(*p*) De Obf. Med. & Anat. Epist. 8. n. 10.

(*q*) N. 18.

(*r*) Sub Obf. 30. (*s*) Sub Obf. 32.

(*t*) A. 1739. Hebdom. 50.

LETTER the FIFTIETH

Treats of Tumours.

1. **T**HOSE diseases which most authors would certainly have plac'd immediately after fevers, the gout, the lues venerea, and others of that kind, Bonetus chose to defer the consideration of; and betwixt these and fevers to place tumours, wounds, ulcers, and others that relate to surgery. And as you know very well, how much this profession was lov'd and cultivated by Valsalva, you perhaps expect a great number of observations; if not from me, whom you know not to be form'd, by nature, for the cutting of living bodies, as I am for that of dead bodies, yet at least from him. And you will find, from the next letter, which will be upon the subject of wounds, that your opinion has not fail'd you. Nor indeed had he a few observations upon tumours.

But some he did not commit to paper; and others, though he did write them down, either he has himself publish'd, or I have describ'd in former letters. All of which I will only refer to here, that you may read them over again if you please; as I will repeat nothing, whether it be his or mine. For although I shall here follow the order of the Sepulchretum also, such as it is, according to my general custom; yet I shall not follow the repetitions. Some of which are not only, like many others, not repetitions of those observations that are openly declar'd to have been given in other sections; but of those that are put down again in this same section; as when, among those that you read in the Additamenta, even the very first, with part of the subjoin'd scholium, had been already given above, in the sixth observation (a), by Bonetus, who did not himself conceal the place from whence he had taken it; or when it happen'd to the same author, which is almost incredible, that, in one and the same page (b), he produc'd one and the same history, from Garnerus, twice over.

2. In regard, therefore, to bloody tumours, either those which are commonly so call'd, or those, in particular, that communicate with some trunk of a vein, (which are the same, in my opinion, that were afterwards nam'd "spurious varices," by Boerhaave (c)) what Valsalva saw of them, and what he thought, you read in the thirteenth of my anatomical epistles (d); and still more in his treatise of the human ear (e); and in both places, in like

(a) §. 7.

(b) Obs. 7. § 1. & 3.

(c) Prælect. ad Infit. § 711.

(d) n. 4.

(e) c. 4. n. 8.

manner

manner (*f*), those things that relate to *steotamata* of the eye-lids. And I could wish he had given his opinion in as express a manner, as to the nature of a certain tumour, of which he has left us the following description.

3. A woman, of fifty years of age, had labour'd, for three months, under a hard tumour, in the right part of the neck, being oblong in its figure, equal to the size of a turkey's egg, and having its basis in the carotid artery of the same side, from whence going upwards, quite to the division of that artery, it terminated there. At length, about twenty days before her death, it began to be very frequently troublesome, especially in that region of the larynx; so that she was oblig'd to breathe with a peculiar kind of stertor, accompanied with a sense of heat in the throat. The woman was therefore carried off.

I will not here, as I did in the case of another tumour, in the left part of the neck, which Valsalva describ'd as being hard likewise, and without making mention of any pulsation (*g*), give you my conjecture upon the nature of it: you yourself will judge of it as you please. And I will go on to give you more certain remarks.

4. A virgin, of a lively disposition, who, by reason of her age, being now advanc'd to about fifty, had been some years without her menstrual purgations, had a cancerous tumour in her right side, near to the axilla. This tumour, by degrees, increas'd greatly in breadth and length, though but little in thickness, and, at length, reach'd to the arm-pit. The neighbouring limb was universally affected with an œdematous tumour. To this was added a cough, a spitting of catarrhus matter, a difficulty of breathing, a great thirst, and finally death.

The tumour, as far as could be perceiv'd by the senses, had not hurt the parts, whereon it was seated, to any considerable depth. In cutting into the neighbouring limb, a great quantity of serum flow'd out, all of which had stagnated in the cells of the adipose membrane. And the whole cavity of the thorax, on the same side, was fill'd with serum of that kind, having many concretions of the same colour swimming in it, of a middle nature betwixt membranous and gelatinous substance, many of which likewise adher'd to the pleura. The lungs were so contracted, that at first sight they almost seem'd to be wanting as it were. The heart was very small.

However, in regard to the belly, the fundus of the stomach was very much extended; the spleen was very small; the liver inclin'd from its natural colour to that of a brown; the gall-bladder was small and empty. The ovaria were white; and although they preserv'd their natural figure and bulk, they had nevertheless grown very hard.

5. You will read an observation of Rondeletius (that is transferr'd into the *Sepulchretum*, not in this place, wherein it is not so much as mention'd, but in the second book (*b*)) which is similar to that in question. For in both of them were an external cancerous tumour, a difficulty of breathing, and a great quantity of serum in the thorax: yet that this serum was collected, in that observation, during the decrease of the tumour; and in this, during

(*f*) Ibid. & nostræ illius Epistolæ, n. 2. (*g*) Epist. 17. n. 19. & 20. (*b*) Sect. 1. Obs. 72.

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the increase, is shown by the time in which the difficulty of breathing came on. And this difference will make you explain the circumstance somewhat differently in that observation, from what you would in this. And as what relates to the ferous tumour of the arm is peculiar to this, so the cause of this tumour was peculiar also; I mean, the compression of the axillary vein, from the cancer raising itself up thither.

6. But now let us come to other tumours of the upper or lower limbs, of a different kind, that have been observ'd by Valsalva, beginning with those that have succeeded venæsection, when ill perform'd. But I omit that which he saw in a noble matron from the puncture of a nerve or tendon, in blood-letting, her hand being greatly swell'd with the very severe pain, and, when that pain was appeas'd, continually trembling: which tremor continu'd not only after the swelling of the hand was abated, but even quite to the day in which he wrote this, that is to say, for five years together, no remedy being of any service.

I, in like manner, omit that which happen'd to a young man, by an unskilful surgeon's having pierc'd through the vein, in the bending of the elbow, the blood being internally effus'd in consequence thereof; from whence afterwards arose an abscess of long and difficult cure.

I will rather describe to you, with the more accuracy, the history of a tumour cur'd by the hand of Valsalva, because it is a thing of greater moment, nor unworthy to be compar'd by you with the observations which relate what has been seen, done, or remark'd, in that part by others; as, for instance, by Rockius (*l*), by Perit the surgeon (*m*), by Teychmeyerus (*n*), and by those whom I read while I was revising this letter, that celebrated physician Trew (*o*), and that industrious surgeon Guattanus (*p*), but especially by the celebrated author of the dissertation to be quoted below (*q*).

This observation, therefore, of Valsalva, although it may seem lame and imperfect in some things, as describ'd in a loose manner by a man who wrote for himself only; has, nevertheless, some things that deserve peculiar attention, as one in particular does; I mean, that a cure of this kind was perform'd by Valsalva, before he had seen it perform'd by others; and that, as he was so skilful and industrious, he would have added other things at different times, if he had liv'd longer, and other opportunities of performing the same operation had occur'd to him.

7. A surgeon, about eighteen years of age, losing blood from the arm, on account of a disorder of the thorax, had his artery wounded. The person who bled him, supposing that he had open'd the vein, tied the wound up in the same manner as if nothing but a vein had been cut into. After some days, a tumour was observ'd in the elbow; which, within twenty days, or somewhat more, encreas'd to the bigness of an apple. This a certain surgeon, supposing it to contain pus, cut into: and from the wound the blood began to flow, but without any impetus, in consequence of the coagula of blood plugging it up, and entirely preventing the discharge.

(*l*) Comm. Litt. A. 1734. Hebd. 36. n. 2.

(*m*) Mem. de l'Acad. R. des Sc. A. 1735.

& 1736.

(*n*) Dissert. de stupendo Aneurysm. & cæt.

(*o*) Act. N. C. Tom. 8. Obs. 126.

(*p*) Hist. 2. Aneurysm. Hist. 1. (*q*) n. 8.

But three days after, the blood, having made a way for itself, burst forth : and that not only on this day, but on the two following days also ; once only every day indeed, yet in such a quantity as could not be restrain'd by any astringent remedies ; and brought the patient into a kind of swooning state. In the mean while, both the hand, and the elbow, and the neighbouring shoulder, almost quite to the middle, became swell'd : and an inflammation had already arisen near to the incised tumour. In such an extremity physicians were call'd, and those such as were well skill'd in surgery also ; among whom was Valsalva ; who, after having weigh'd the case accurately, began the cure in the following manner :

In the first place, he bound the upper arm with the bandage which they now call the torcular, or tourniquet, in such a manner that it might be speedily and easily relax'd upon occasion. He then carried up the incision, which had been made by the surgeon, as I have said, upon the tumour, towards the superior parts, and in the usual course of the artery. Thus the whole cavity of the tumour being laid open, which would almost have contain'd a man's fist, he drew out the blood, both fluid and coagulated, where-with it was fill'd ; and wash'd the place very well with sponges moisten'd with warm wine. And this being done, he order'd the bandage to be relax'd a little ; until the blood, flowing out, should show the situation of the wounded artery. This was in the fundus of the cavity ; so that it was very inconvenient to tie up the artery, by reason of the depth. But having, at length, tied it immediately above the wound, the blood no more sprang forth, even when the bandage was relax'd.

However, all the part of that limb, which was below this ligature made upon the artery, instantly lost its power of feeling and motion ; and a few hours after became quite cold : nor was a pulse any longer perceiv'd. Yet this pulse began to be perceiv'd again about the third day, from the time of making the ligature, though in a very small degree : but about the fifth it had return'd almost to its natural impetus. In the latter part of this day blood was observ'd in the bed ; and, for that reason, the bandages about the wound were seen to be wet. But when these were cautiously remov'd, and the wound examin'd, no blood was discharg'd ; nor was there any sign from whence it had been discharg'd. From this last eruption of blood the pulse was again entirely lost ; just as if a new ligature had been thrown around the artery. But the limb, nevertheless, recover'd its natural heat, gradually, a few days after, and its motion also, though this last more slowly ; for a weakness remain'd eight or nine months, and a kind of wasting, a brown colour of the nails, and a great proneness to be hurt by cold. After this period of time however, which I have mention'd, all these symptoms went off ; and the pulse return'd, though in a languid state.

8. This history having been requested of me, by that celebrated man Peter Paul Molinelli, I immediately, and very readily, sent it him ; not only that I might oblige a man who excell'd in the medical and chirurgical art, and deserv'd very well of me, but also that the history, which I sent to him in an imperfect state, he might, as having known the surgeon when living, and dissected his body after death, make complete for me, as far as this was possible.

And this you will find to be extremely well done by him, if you read his dissertation, which is entitled, “Of an aneurism from the artery of the arm being wounded in letting blood.” The chief things which he has added are the following: that Valsalva had applied not one ligature only round the artery, but many; being compell’d thereto by the difficulty of stopping the blood: that the man had afterwards liv’d in pretty good health; and did not die till about thirty years after this operation; when he was taken off by a consumption and ascites: and that he had been wont to make use of that arm which had been injur’d, just as he did the other, since you could now perceive no difference by comparing the two arms together, not so much as in the pulse.

This is the more to be wonder’d at because, in the dissection of the body after death, although the brachial artery was entirely deficient, to the extent of two inches, in that part where the aneurism had been; that is to say, in consequence of having been destroy’d formerly by disease, by the knife, and by abscess, or sloughs; there could be found no artery but one which could keep up the communication instead of it, betwixt its superior trunk, and the radial and ulnar arteries; and this was not only surprizingly tortuous, but so slender, that it was very difficult to conceive how the radial artery, as so little blood flow’d into it, and this blood was carried through so many flexures, could pulsate equally with the artery in the other arm; and, again, how it was that both arms were equally well nourish’d, and robust; or, at least, equally fit for every kind of action.

Indeed that part of the nerve which lay in the same tract, wherein I have said the brachial artery was wanting, was found to be enlarg’d into the form of a very considerable ganglion. But although you should imagine that the strength of the nerve might be increas’d by this means; you, nevertheless, could not conceive of the proper strength of the muscles, the nutrition of the parts, and, particularly, the pulsation of the arteries, without a proper quantity of blood flowing in, and that with a proper impetus. And certainly, when a principal trunk of an artery is shut up, the most learned men, and among these Haller (r), did not doubt, “from physics, and hydraulics, but the lateral branches, although small, may afterwards be distended, if they are acted upon by a fluid alone:” and, indeed, the same Haller (s) affirm’d it “to be commonly known, and to have been seen by him, that upon cutting the radial artery away, the ulnar had been so dilated, that all the branches which are supplied by the radial, receiv’d their blood from thence.”

Wherefore it is the more to be wish’d that the enquiry may be repeated, in the bodies of those in whom the brachial artery itself has been tied up while living, for the sake of curing an aneurism in the flexure of the elbow, by every anatomist who has opportunity to make it; and particularly by the same very excellent Molinelli: so that, as he has describ’d with so much accuracy what he found in this first case, he might be able to inform us, even by the help of injection, whether the same, or different appearances, occur in bodies of this kind. For although the trunk of that artery is seldom

(r) Dissert. de Arteria Brachii not. ad §. 45. (s) in Boerh. Prælect. ad Instit. §. 692. not. 2.
double,

double, yet that the branches going from thence, both into the ulnar and the radial artery, which the celebrated Winslow (*t*) calls collateral branches, do not appear in the same manner in all bodies; but that there are many in most bodies, sufficiently appears, even from the descriptions of this author, and the illustrious Haller (*u*), when compar'd one with another. It is, therefore, probable it will at one time happen, that more than one of the collateral branches offer themselves to the eyes in a dilated state; and at another time, one only: although, even upon this hypothesis, it could not be sufficiently understood, how what Valsalva had observ'd, about the fifth day after tying up the artery, could happen; for if the dilatation of those branches must be brought on by degrees, how had the pulse so soon return'd to its natural impetus?

But in regard to the nerves; although the communications of the brachial one with another, and the frequent distribution of more than one branch therefrom into one muscle, may, perhaps, tend to make us not quite so solicitous about making the same enquiry in respect to them, as we did in respect to the arteries; without doubt that change which the celebrated enquirer has observ'd, that change, I say, of the nerve, which seems to have been tied up together with the artery into a very large ganglion, deserves to be confirm'd by many observations upon bodies of that kind; or even by experiments on brute animals, made with accuracy and attention: and it ought also to be enquir'd, whether this enlargement be owing to the very manifest dilatation of the arterial branch flowing into it, or rather, if this does not always occur, to the ligature made upon the nerve.

And I now see that this wish has been sufficiently completed since my writing this letter (*x*), as far as relates to brute animals, by experiments which, as I judge them to be worthy of more than common praise in themselves, so, if I am to consider them as repetitions of the experiments of Valsalva, I hope to have a more convenient place of considering and saying what I wish for even in them. For at present it will be much more useful to you to consider with diligence and attention, the observations and remarks which the celebrated Molinelli has made, in that clear and fruitful dissertation, on performing the cure of the aneurism in the flexure of the elbow; not only by tying up the nerve with the artery more expeditiously, but also by throwing ligatures more safely round the aneurismal sac; and join them with those cures which he may perform hereafter. However, although he has completed the above observation of Valsalva for us, I do not very well know whom I can now find to make the following complete.

9. A certain man had labour'd under an aneurism in the left ham about ten years, which gave him great pain, and was equal nearly to three inches and a half, of the measure of Bologna, in its diameter. This being cur'd by Valsalva, the patient was at last carried off by another aneurism in the

(*t*) *Expof. Anat. tr. des Arter. n. 140. & cat.*

(*u*) *Differt. cit. §. 17. 19. & feqq. & 28. 36. 45. Adde nunc Fascic. Icon. Anat. 6.*

* *Guattani Hift. cit. Fig. 1.*

(*x*) *De Bonon. Sc. Inf. Tom. 3. in Opusc. & Quæft. Præfide Hazon Parif. propof. 5. Febr. 1750. n. 4.*

right ham. And when his body was open'd, a third aneurism was found to have been form'd at the curvature of the great artery.

10. As Laurence Heister, who is a very learned surgeon and physician, if any man is, in that dissertation which is entitl'd "Of the structure of the "knees, and their diseases (*y*)," has admonish'd us, that "very few" aneurisms had been remark'd in the ham; and, indeed, besides those that he himself mentions, I scarcely remember to have read of more than two, the first of which was formerly pointed out in one word by Severinus (*z*); and as to the other, Matanus (*a*) has very lately told us how great a quantity of blood it contain'd; I, therefore, was not willing to omit this observation of Valsalva, although obscure (if you consider those things that I shall say presently) and imperfect; as, besides other things, it shows, at least, how liable some bodies are to aneurisms.

But although the very experienc'd Heister thinks the same method of cure which is made use of in the aneurism of the elbow, to be "not impracticable" in the ham also (*b*), on account of the same hope (which you will now see confirm'd by the very excellent Haller (*c*)) of the branches of the artery communicating laterally, and indeed professes that he would undertake the operation whenever the case may offer; yet, as I never found any thing more in respect thereto to have been added by Valsalva, than what I have written in the history, I did not take upon me to determine by what method he had made the cure.

There were, indeed, among the papers of Valsalva, two figures, skilfully and elegantly drawn; one of which represents the popliteal artery on the surface that is turn'd towards the external parts; the other represents it on the opposite side, dilating itself, from the external surface, into an oblong sac, which is narrower in proportion as it ascends the more, and not without three orifices of arterial branches communicating with the narrower part of the sac: so that unless this part was tied up with a ligature, according to the custom of the celebrated Molinelli, it would have requir'd a very long and tedious manual operation; and yet the sac is represented as entirely whole on the external side. For which reason, and the man's dying of an aneurism that had been form'd in the other ham, I almost conjectur'd that the latter, rather than the former, had been drawn in these figures, as Valsalva had taken it out from the dead body.

Nevertheless, it did not appear clear by what method he had cur'd that other, till, turning over the observations of the celebrated Benevoli, I happen'd to light on a passage, where (*d*), speaking in commendation of the method already taken notice of to you on a former occasion (*e*), in which Valsalva us'd to cure aneurisms by letting blood frequently, and afterwards using a very spare diet; he asserts that he had seen, in the study of Valsalva, an example of one thus cur'd "in the popliteal artery," from a man who had been carried off by some other disease after the completion of this cure.

(*y*) N. 83.

(*z*) De recond. Abscess. nat. l. 4. c. 7. prope finem ad n. 2.

(*a*) De Aneurysmatic. præcord. Morbis Animadv. not. a ad § 71.

(*b*) Dissert. indicata, n. 76, 77.

(*c*) Fascic. Icon. Anat. 5. ad Tab. 4.

(*d*) Observ. 11.

(*e*) Epist. 17. n. 30.

For having read these words, and taken those figures into my hands, when I observ'd that the sac was certainly represented of a diameter far less than that which is propos'd above (*f*); I began to think, that the very great contraction of the sac was to be ascrib'd to this kind of cure: which, although Valsalva had made use of it against internal, and those incipient, aneurisms, he would, perhaps, have been willing to apply against this also, adding a compressing bandage, and other external assistances. But as I see some things which do not sufficiently agree with this conjecture, I therefore leave it entirely to your determination: I pronounce nothing myself, and return now to more certain things.

11. A man, of forty years of age, had a small but pulsating tumour which arose gradually about the right groin. Through the space of three years it encreas'd every day, and became large. About the third month before his death, it began to trouble him with pains, and to bring on a large and equal œdematous swelling through the whole of that lower limb. In the last month the pains became very violent, and not at the tumour only, but sometimes also below the internal ankle: in which one place, and only when the pains were troublesome, the foot had feeling, being at other times depriv'd of all power of feeling and motion. There was never any respite from excruciating pain through the whole of this month, and no sleep; till at length, the patient's strength being worn out, he lay half-asleep for some days, and in this manner died.

This aneurism had an immense cavity; for it reach'd from the anterior skin of the upper part of the thigh to the thickest of all the nerves, the *cruralis posticus*. And, indeed, the crural artery, from the dilatation of which the tumour had begun, was found to be moderately dilated; but being in some places torn asunder, or eroded, it had thrown out the blood through these apertures in such a quantity, and with such an impetus, that the muscles partly being corroded, and partly giving way, it had produc'd a very large cavity, as I have already said, and had eroded that very nerve which I mention'd just now, in such a manner, that only a few fibres of it remain'd, by which the upper part was join'd with the lower. All that cavity was full of coagulated blood and polypous concretions, as they seem'd to be.

12. The dissection very clearly shows the cause of all the symptoms that the man suffer'd. For after that the aneurism had degenerated from a true to a spurious one, in the manner that the word "spurious" is generally understood; that is, after the coats of the dilated artery, being ruptur'd or eroded, began to pour out the blood into the neighbouring parts; the remainder of this fluid could not now be sent, either with that force or in that quantity, into the parts below, which are requir'd to preserve its speedy return through the veins: hence the œdematous swelling of the limb. And the extravasated blood, while by tearing the muscles one from another, it at the same time lacerated the little nerves with the interpos'd membranes, or at least caus'd a distraction therein, created pains; but such as were more easily to be borne than when it, at length, reach'd to that very thick nerve, and being now made more acrid by stagnation, began to erode it.

(*f*) N. 9.

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At length, when the nerve was so far eroded as to that part from whence almost all the branches proceed that bring the power of feeling and moving to the foot; both of these powers were lost therein, if you except that place which is near the internal ankle: for to this place belongs a branch that does not proceed from this posterior, but from the anterior crural nerve, and generally accompanies the vena saphena. There is no need to explain in what manner the other symptoms were the consequences of continual pains.

It is better to observe, from the succession of these, and even of death itself, that where aneurisms, even when external, are seated very near to the nerves, or to other parts of a quick and lively sensation, notwithstanding they do not immediately become destructive by being ruptur'd and pouring out their blood, they may, nevertheless, carry off the patients by very severe and excruciating pains. And this will be confirm'd to you, besides the history which I lately saw publish'd by Guattanus (*g*), and which may be compar'd with this of Valsalva, by some observations of Marcus Aurelius Severinus (*b*) on a Grecian man, and on a shoemaker.

But although you will very readily read the description of the aneurism in Anselmus Paganus, which Severinus has taken notice of with the others, as it is very similar to that just now propos'd from Valsalva in its situation, magnitude, and most other of its circumstances; yet when you consider the incredible, I had almost said, cure of the same, you will be very much surpriz'd that, among the problems explain'd by Severinus, this principal one was not very clearly and accurately discuss'd; I mean, how the crural artery, "when putrefied, dissolv'd, and broken down," near to the groin, could, by the force of fire applied thereto, again recover its parietes; so that the limb not only continu'd to live, but the man could even walk upright upon it, only with the small support of a low and slender cane.

13. In regard to other tumours which relate to this letter, Valsalva has left us nothing in writing besides what has been said above; unless we should chuse to refer to this class those very few words which he has cursorily thrown into his medical responses. In one of them, which is of the hæmorrhoids, he says that some condylomata, describ'd with these, may be blind piles, as those which, being often cover'd over with a coat of fat, do not seem to be vessels dilated, as they really are, but excrescences of another nature.

And in another response given upon an old tumour in the knee, which was taken for an exostosis, it is natural to suppose, says he, as the tumour began to appear immediately after the retropulsion of a scabies, in which there was some suspicion of a latent venereal virus, that the particles which, by previously vitiating the blood, had produc'd a scabies, being obstructed in that part, had given origin to the tumour, either by lacerating the fibres of the bony substance, just as when the fibres of oaks being pierc'd through by insects, galls, or oak-apples, rise upon them; or by stagnating with the humours flowing through the joints, which is a thing that very easily happens, by reason of the narrowness of the vessels in places of that kind; for being thus cemented with the ligaments and tendons, they have increas'd the thickness and

(*g*) Hist. 2. Aneurysm. Hist. 2.

(*b*) De recond. Abscess. nat. l. 4. c. 7.

the hardness of both : wherefore, if they are compress'd with the hand, they entirely bear the similitude of bone ; although to those who enquire by dissection, which sometimes, says he, I have had opportunity to do, they resemble the internal substance of the root of the reed, if I may be allow'd to use a kind of gross comparison,

14. These things, then, have been left in writing by Valsalva. And some other things which were done and observ'd by him, he related to me ; or observ'd and did even when I was present : and these I will now communicate to you. The first of which you may, in some measure, compare with that observation of our Fabricius, which I formerly refer'd to in the second of the *Adversaria* (i), or with another of that illustrious man Heister (k) ; or rather, if you chuse to refer both of these to the class of *ganglia*, you may compare it, in some measure, as I have said, with that which the very illustrious archiater Van Swieten (l) has taken notice of.

15. A virgin, as was related to me by Valsalva, had a very small protuberance of the ankle, which, for more than sixteen years after, created such violent pains, that if she had not been prevented by her domestics, she would have cut off her foot.

Making an incision, therefore, in that part, according to the longitudinal direction of the leg, under the common integuments a gland, of a small size, was found by him, of an oval figure, but depress'd, and, as to its colour and nature, seemingly in a middle state betwixt the conglobate and conglomerate kinds. This gland being taken away, the pain no more return'd.

16. A rustic woman, whom by looking at you would have suppos'd to be dying of old-age, weak, wrinkled, dry, and even brought down to the most emaciated state, lay ill in the hospital for Incurables, at Bologna. The cause of all her misfortunes was her right breast, which had grown out into a tumour, of a form and size that resembled the human brain. This tumour, being every-where and altogether ulcerated, show'd in several places, amidst its red and bloody substance, many glands, as it were, equal in size to the largest grapes, but white in their colour, oblong, and smooth. As there was no room to attempt any other method of cure, on account of the woman's decay of strength in particular ; it came into Valsalva's mind to constrict the basis of the tumour, which was large indeed, but less so than the other part, as far as the woman could bear it, by making a bandage thereon.

By this continual constriction being increas'd every day, it naturally follow'd that the edges of the tumour were depriv'd of their nourishment, and became dead all about ; so that they could be cut away all round with the scissors without pain or effusion of blood ; and the circumference of the basis was more and more diminish'd. This method being continu'd for a considerable time, that very large tumour was reduc'd to a very small bulk, and at length safely amputated. Wherefore a cicatrix being brought on, the woman, in the mean while, departed much recover'd in her health.

And lest you should doubt whether she was perfectly cur'd in that part, it not only happen'd to me to see the other circumstances which I have related

(i) *Animad.* 24.

(k) *Dissert. de Tumorib. Cystic. singularib.* n. 36.

(l) *Comment. in Boerh. Aph.* § 1084.

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to you, but a year or two after I even saw what I am going to relate to you now. For one day, when I happen'd to be in the hospital together with Valsalva, behold a certain woman came to us, who saluted him and me also, as very well known to her, being of a very good habit of body, of a good colour, and, to appearance, of such an age, that she might seem to be the daughter, or rather the grand-daughter, of the other, whom I describ'd to you just now. Yet she was the very same I have spoken of, and she wonder'd she was not known by us; You will know very well, says she, who I am, when I shall have told you the reason of my coming here: and no sooner had she said this, but she open'd her bosom, which was without any breast on one side; but sound both on the right and the left side also: except that a small swelling began to be perceiv'd under the skin of the breast.

In this manner, said she, the former tumour began: I therefore came hither that this new tumour may be cut out, before it encreases to any considerable size. And this was done a few days after by Valsalva; who was afraid, nevertheless, that fresh and fresh tumours would still arise; and that even when this breast was taken away at length, the same would be form'd in some other place, and particularly in the uterus. And that he was not afraid of this without reason, is shown by too frequent observation: and indeed the very learned dissertation of that illustrious man Triller (*m*), will show you that he had reason to fear even worse consequences: after reading of which, and considering what more severe diseases follow the extirpation of a cancer, for the most part, you may judge whether so great a severity of evils is compensated by the truce that may have been gain'd for a year or two: although the patient, so that she be but deliver'd from the present pains, which would soon prove fatal, either does not suppose that others more violent will come on soon after, and kill her in a more cruel manner; or if she does believe it, does not, however, pay so much regard to them, as what is to happen after some time.

17. I also saw a tumour of a far different kind cut out by Valsalva. Which, however, as I myself dissected it after being cut out, with his consent, I shall describe below in its proper place. For now I must go on to my own dissections. And first, not to repeat here what I have written elsewhere, you have in the same treatise, and the same epistle, which are taken notice of above (*n*), what I myself have observ'd of those spurious varices, and of the steatomata of the eye-lids, when I pointed out what Valsalva has said of both these kinds of tumours. And in regard to steatomata, and other encysted tumours, many things that deserve to be read are extant in that epistle of Boerhaave, which is entitled, "Of the structure of glands;" and, in like manner, in the prælections upon his institutions (*o*).

And although the same author, as it seems, gives an instance of a tumour containing an aqueous humour, not in just the same manner in both places; being, as I suppose, a little forgetful; yet it sufficiently appears, which is the principal thing, that he had seen a tumour of this kind: and this obser-

(*m*). De nociva Canceri inveter. Extirpatione
Hist. præsertim 3. & Observ. addit. §. 17.
& seqq.

(*n*) n. 2.
(*o*) ad §. 711.

vation may be confirm'd by many examples added from the celebrated Heister (p). And to the same class belongs, in part, the description of certain tumours in the head of an infant; which is transferr'd from Blasius into this section of the Sepulchretum (q); although the water was divided into many hydatids. That which I observ'd in the following manner was more free, though it seem'd at first to be otherwise.

18. One of the bodies, the head and neck of which I made use of in my public anatomical demonstrations of the year 1750, had a small tumour at the left side of the os hyoides.

The tumour being laid quite bare by dissection, and being set at liberty from the left horn of the os hyoides, to which it was externally connected, represented a congeries of hydatids, not larger than the last joint of the little finger. But having slightly prick'd the edge of it, the somewhat turbid water, which it contain'd, all immediately flow'd down, with even the slightest pressure.

19. This, probably, might have been the beginning of a large tumour, if the man had liv'd much longer: although I think that tumours like these are to be plac'd in the number of those which, while they are as yet incipient, are dissolv'd without great difficulty: and I believe that one, which I saw form'd on the external part of the wrist in my wife, to have been probably of this kind; being of the shape, hardness, and magnitude of a filbert. For though she had been troubled with it for many weeks, behold one morning when she rose out of bed, she found it to have been suddenly and entirely vanish'd during the night. The truth of which I was immediately witness to. But not many days after, the same tumour return'd; and after a much shorter time than before, again vanish'd away suddenly, never to return more; and what had not happen'd before, left the skin in that part distinguish'd by some red pustules as it were; which went away of themselves likewise soon after.

It was the summer-time, and she had made use of resolvent cerates and pressure; having happen'd to hear from me that Valsalva ascribed so great effects to this latter, as to order an encysted tumour, which he himself had on one of his scapulas, to be compress'd even with the feet, in order to retard its encrease. But she had us'd moderate pressure only, as I persuaded her, and that merely on the first days; and the cerates not for a long time, or at least not constantly; as they seem'd to be of no advantage. Nor indeed, if you should rather choose to consider it as a ganglion, shall I greatly object to your opinion; for it was recent; so that there was no necessity to suppose it contain'd in very thick involucra; or to suppose that it included a humour, which a long-continu'd absorption of the thinner particles had left more glutinous and less dissipable.

You perceive I do not think in any different manner, of the matter of ganglions, from what their frequent dissections have shown. Some of which you will read in the celebrated Heister (r); and others you will add from the

(p) Differt. supra ad n. 14. cit.

(q) Obs. 1. §. 5.

(r) Instit. Chir. P. 2. S. 6. c. 171. n. 2.

observation of those excellent men Weiffius (*s*) and Ellerus (*t*). However, our country surgeons, as you very well know, call encysted tumours *natte*; comprising in this one word, not only those three common kinds, but others; almost all of them, if you except the more learned, being entirely ignorant how different a matter from those they sometimes contain; and not so much as suspecting, that where there is a hardness, there water may be; both of which have been observ'd by Boerhaave (*u*), and by Heister (*uu*), in theirs.

But there are, also, other peculiar kinds of tumours; as, for example's sake, that which Jo. Paulus Kellius (*x*) exhibited, when Salzmannus was president, consisting nearly of membranes alone; which lying one upon another, in the manner of lamellæ, had produc'd a tumour in the neck, that was equal to the weight of five pounds; an instance that had scarcely ever occur'd to any one before; or that which after others, and particularly after Severinus (*y*), is describ'd by the very experienc'd Benevoli (*z*), containing a substance similar to something polypous. In reading of whose observation, I call'd to mind another, which our Mediavia communicated to me on the very day he made it, that is, in the month of June, in the year 1735.

20. A monk had a tumour form'd upon the region of one rotula, or knee-pan, which was equal to a man's fist in its size, hard, moveable, and free from pain; they call'd it *natta*.

The common integuments being cut into, and easily drawn asunder; for there were no very close connections that prevented it, and the blood-vessels, though very thick indeed, were very small; the tumour was separated from the tendons that cover the knee-pan, with as much ease as one muscle is generally separated from another. Wherefore, the coat being uninjur'd, the tumour was taken away; and when cut into, shew'd this coat to be pretty thick; so that it might be divided into three laminæ, the middle of which was the thickest.

And whatever solid matter there was contain'd within the coat, was, to appearance, of a polypous substance; and that form'd into a kind of cancelli, so as to resemble, in some measure, the spongy structure which we see within the heads of the bones. All these cancelli were full of a dilute blood.

21. Tumours of this kind might, perhaps, have been plac'd among those which Celsus (*a*) says, contain "somewhat like a heavy and bloody flesh," if he had not class'd them among the soft and yielding tumours. Boerhaave (*b*), who does not easily suppose that sarcomata are propagated from, and made up of, true fleshy fibres, but of the adipose membrane; the fat of which, by reason of the small vessels being distended with blood, resembles red flesh; also asserts that tumours thus form'd are included in a thin pellicle; and can, for that reason, be taken away in an entire state.

(*s*) Vid. *Commerc. Litter. A.* 1745. Hebd.

24. n. 1.

(*t*) Vid. *Act. Erud. Lips. A.* 1750. M.

Octobr.

(*u*) (*uu*) Vid. *supra* ad n. 17.

(*x*) *Disput. de Tumore tunicato membranac.* §. 1. & 7.

(*y*) l. 4. *supra* ad n. 10. cit. c. 2. & 3.

(*z*) *Observaz.* 16.

(*a*) *De Medic.* l. 7. c. 6.

(*b*) *Prælect.* §. *supra* ad n. 17. cit.

And, indeed, I formerly said in the *Adversaria* (c), that I had seen fat sometimes in the sacculi of this membrane, so ting'd with blood, that these sacculi themselves resembl'd flesh. But whether the case was thus or not, or rather whether the redness was in the very thick and distended vessels which creep through the very frequent and very thin little membranes, that are interpos'd to the fat, and seen through it; it certainly did not happen to me, at that time, to see those parts of the adipose membrane conglobated into a tumour, and surrounded with a peculiar coat. And though I would not deny but this might have happen'd to others; yet I believe that, on the other hand, all will not deny but these fleshy excrescences may easily arise from the fleshy fibres themselves, where any part of them is lacerated or eroded.

But these excrescences do not relate to encysted tumours, nor yet the excrescences of the adipose membrane. Yet as some very learned men may seem to have confounded these latter with steatomata, and others may seem to have distinguish'd them from these indeed, and nevertheless to have plac'd them among encysted tumours; I will here fully explain to you what I understand by the term of excrescence of the adipose membrane, and what structure thereof I have observ'd.

22. John Philip Jagrasias, where he treats of the *natta* (d), which, he says, he had seen only in the scapulæ, having found fat contain'd therein, though sometimes flesh also, does not doubt but it is to be reduc'd to the class of steatomata. And our Fabricius ab Aquapendente (e) asserts, that the steatoma, when it is not in the head, but in other parts, "seems to contain a matter rather similar to other fat than to suet." Which remark clearly shows, that our ancestors, although a sebaceous matter was not found by them in tumours, but fat, did not, for this reason, suppose that a new class of tumours was to be constituted, as in our memory Littere (f), who thought proper that a tumour of this kind should be separated from a steatoma, and call'd a lipoma, such as he saw on the scapula of a man, full of soft fat, not sebaceous matter. Yet Ruysch (g), when he afterwards describ'd a tumour of that kind in a few words, continu'd to call it a steatoma.

But Palfin (b), taking notice of two tumours of the same kind, which had grown out to a prodigious size in the back of two women, makes use of neither term; and what all those whom I have nam'd have either expressly done, or at least in such a manner, that, upon well weighing all things, we may conjecture the same thing, omits himself to tell us, whether these tumours of those women were comprehended in a peculiar cyst likewise.

Nor, indeed, does he, or the others, declare with sufficient plainness, what fat was found in those tumours, whether it was comprehended in many cells, as in the adipose membrane, or whether it fill'd up the whole cavity, without any small membranes being interpos'd; so that those who read the account may be suspicious that it was, if not "liquefied oil," with which

(c) II. Animad. 6.

(d) in fine Tract. de Tumor. p. n.

(e) in fine Append. l. 1. Chirurg.

(f) Hist. de l'Acad. R. des Sc. A. 1709. Obs. Anat. 3.

(g) Epist. ad Boerh.

(b) Anat. du corp. hum. tr. 2. ch. 2.

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Boerhaave (*i*) asserts, that he, in conjunction with Ruysch, had seen a tumour (of eight pounds in weight, taken from the back of a porter) fill'd; yet, at least, that it was a "substance" which "was nothing but oil," as he had said a little above, when taking notice of another tumour, or else the same, as it weigh'd just the same number of pounds, and was seen by Ruysch.

It is not certain therefore, notwithstanding some of them might be, that all the tumours I have spoken of were excrescences of the adipose membrane itself, as that in fact was, which is describ'd about the scapula of a woman, by Blesius (*k*), and call'd *excrescentia adiposa* by him: which I omitted among those taken notice of above, not because it was dissimilar in the substance which it contain'd; for this resembl'd nothing but a yellowish fat; but because the same substance was not soft, but endow'd, in some measure, with a cartilaginous hardness.

I, however, formerly sent an observation to Schrockius, of a large adipose tumour, which itself also possess'd the region of the scapula; and that was in a woman too, as most of the others that I have spoken of likewise were. If you read this, for it is publish'd by Schrockius (*l*), and for that reason will not be repeated here, and join with it another, which I shall immediately subjoin, you will easily perceive how far my observations and opinions differ from those of others.

23. A man, without any previous cause that he knew of, had a small tumour appear in the common integuments of one buttock. This tumour encreasing by degrees, at length reach'd to such a size, as to equal the magnitude of a child's head, if not to exceed it. It was of a globular form, and being connected to the buttock by a short peduncle, not thicker than two thumbs, hung-downwards. There was the same colour both in the peduncle and the tumour, as in the other parts of the skin. There was no pain if you handled them, no hardness, no fluctuation, no pulsation. But the bulk was inconvenient to him when sitting, and the weight (although it was sustain'd with a broad and proper bandage, lest the tumour should increase by distraction, as it was very possible for it to do) was uneasy to him when standing or walking; and, at length, a fever, and a sense of violent heat, which two symptoms sometimes follow'd a very long or very quick walking, laid the man under a necessity of consulting Valsalva.

Valsalva having consider'd the whole of the case, and not doubting but the tumour should be taken off, perform'd the operation a few days after, in my presence, and in the following manner. After having tied up the peduncle by a ligature, near to the globe of the tumour, and not having, even by this means, perceiv'd any pulsation above the ligature, which show'd the existence of any pretty considerable artery in that part, he cut the peduncle across, above the ligature. Nor did any more blood come forth upon the incision, than he had expected; but one small artery showing itself, and that so very small as to be stopp'd by compression alone, and but one vein of any importance, which however was but small, running at the side of

(*i*) Prælect. ad § cit. supra ad n. 17.

(*k*) Part. 1. Obs. Med. rar. 3.

(*l*) Eph. N. C. Cent. 5. Obs. 17.

the peduncle under the skin, and being manifest before dissection. And the wound being in a man of a good habit of body, and at a good season of the year; for it was the spring of the year 1704; which much forwarded the advantage of remedies, was very soon heal'd up.

As the tumour had been taken out by Valsalva while I was looking on, so it was cut into and examin'd by me on the same day, while he look'd on. In the very place of excision, before I began to dissect it, there appear'd four or five cylindrical bodies, as it were, of the thickness of a little finger, of which the peduncle consisted. Pursuing the course of these bodies then, I saw that the tumour was nothing else but the production thereof. For being become very thick, unequal, and tortuous, and being divided, each into many, they made up the whole of that bulk. Nor was there any need of the knife to disjoin them; for they were better disjoin'd by the fingers, and more easily, that is, by pushing them on gradually.

The structure and nature of these bodies was the same in the peduncle, and every where else; that is to say, their nature and structure was the same with that of the adipose membrane; so as to differ from it in no point, whether you consider'd the surrounding and interpos'd little membranes, or the fat they contain'd, which was soft and greasy to the fingers, and inclining from a white colour to a yellow, of which kind the fat in the most healthy bodies is. No sanguiferous vessels appear'd to the eye, except at the upper part; and these were small, as I had before perceiv'd to be the case, from what I remark'd during the excision. However, the whole tumour was surrounded with a pretty thick skin, so that you might divide it into two laminæ with the scalpel.

24. I do not doubt but from this observation, and the observation I sent to Schrockius, which agrees with this in every circumstance, you will clearly perceive, that these two tumours, dissected by me, were nothing but excrescences of the adipose membrane itself, that lies under the skin; as they were not made up of fat more or less liquid, and every where comprehended in a peculiar cyst, but made up of fat which was included in the membranous cells, not only endow'd with the same structure and nature wherewith they evidently are endow'd in that membrane, but, as the transverse section both of the peduncle and basis shew'd, evidently continu'd into that membrane.

Nor is the internal of those two laminæ, into which I have said that the skin might be divided, to be consider'd as a peculiar cyst; not only because I know that it was not allowable to do so in that other observation, but also in particular, because in either one or the other, if there had been a cyst which every where embrac'd the tumour, certainly that portion of the cyst which comprehended the upper part, would have been left within in its proper situation, as it was not cut out together with the tumour: and that it was not left within is to be argu'd from hence, that the wounds of both patients were easily heal'd, and without the assistance of such things as destroy a portion of the follicle left behind, by corroding or putrefying it; whereas if this be not consum'd, the wound is not brought to a firm cicatrix, and the tumour returns afterwards: neither of which circumstances happen'd to these patients.

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To this very kind of tumour, I should suppose, belong'd that which I have already (*m*) mention'd to you, as being taken for an omphalo-epiplocele, by physicians of eminence; whereas in the body, after death, no hernia was found there, but only a prominence from a quantity of fat which the cells, indeed, of the subjected membrana adiposa contain'd, but no peculiar cyst. And that to this class belong that globe of sound fat, which I formerly spoke of to you in another letter (*n*), as lying under the skin of the abdomen in like manner, but somewhat higher than the other; that is to say, about the ensiform cartilage of an old woman; I, for a certainty, know, inasmuch as I dissected it myself, and clearly saw that it appear'd in the manner I here require; as I do also of that which I shall describe hereafter (*o*), as having been accurately examin'd by me in the thigh of another woman.

And that of the two propos'd by Littre, the one which he himself also found in the thigh of a decrepit woman (*p*) was similar to these, I should more readily believe, than of that, taken notice of above (*q*), upon the scapula of a man; as in this he not only has made no mention of cells, but has even expressly suppos'd a cyst wherewith it was surrounded; whereas in that tumour of the woman he makes mention of cells indeed, but by no means of a cyst; and even when there is a necessity of coming to the amputation of a tumour which does not yield to those things that he recommends to be applied externally, in the beginning, he would have nothing of the tumour left behind, lest, as he says, it should happen to spring forth again from some cell that was already relax'd, and not from the remains of the cyst, which, if he had then seen it to exist in any part, he would not there have omitted.

A tumour made up of fat Littre suppos'd to be very rare, and perhaps not seen before. Yet Elsholzius (*r*) had, thirty-eight years before, publish'd the dissection of a tumour, under the name of a steatoma, which having been form'd in a soldier, almost betwixt his thighs, contain'd fat, "in very thin little membranes, dispers'd through the whole mass of the tumour, and distinguish'd into cells as it were." And this tumour I could scarcely suppose to differ from those that I dissected, even considering the representation of it when dissected, if a surrounding follicle had not been spoken of, and that almost equal to a goose-quill in thickness.

There are others also, of which mention is made by Alexander Camerarius (*s*), as containing fat, or a matter similar to fat; but with this other, and still other substances, and amongst these some having glands lying betwixt, or as not existing in the membrana adiposa; so that I cannot consider them as true excrescences of this membrane; as I, in like manner, cannot those that are describ'd in the *Commercium Litterarium* (*t*), as made up "of fat like the udder of a beast, or the breast of a woman, being contain'd in its proper cells, tenacious, hard, and thick, and having very large vessels

(*m*) Epist. 43. n. 10.

(*n*) Epist. 19. n. 18.

(*o*) Epist. 68. n. 6. Adde etiam alterum
ibid. n. 8.

(*p*) Hist. de l'Acad. R. des Sc. A. 1704.
Obs. Anat. 1.

(*q*) N. 22. (*r*) Hist. Steatomat. resecti.

(*s*) Hist. Pedis tumid.

(*t*) A. 1741. Hebdom. 1. n. 4.

"carrying red blood interspers'd with it:" although I do not deny but these might have been so in the beginning, as well as those describ'd by me. Be this as it will, however, I take upon me to persuade you to join these to this section of the Sepulchretum, as you may do it with justice.

And I think just in the same manner of two tumours in particular, one of which was describ'd by Jo. George Hoyer (*u*), and the other by Elias Camerarius (*x*); the former in a woman of an advanc'd age, about the region of the left scapula; the latter upon the knee of a man, and above it. The improper methods of application that had been made use of by mountebanks, might change many things in both tumours, as far as relates to the substances interpos'd to their more deep and retir'd situation, or to the consistence of the fat; and those appearances that are call'd glandular conglomerations, but are said to consist of a matter similar to the adipose substance, and those parts that are said to be many alveoli, as it were, or small cavities, from which the softer fat was press'd out, might formerly have been the cells of this fat.

But these things amount to no more than conjecture: this is certain, that if I had found a tumour of that kind whereof you have a very small one describ'd in the forty-fourth letter (*y*) under the skin itself, as I did in the mesentery, I should never have class'd it among the true excrescences of the adipose membrane; for it contain'd fat which was not separated by the laminæ of the cells, and was every-where comprehended in one spherical follicle.

25. But whatever cause may relax the skin in a certain place, so as to make it give less resistance to the weight or bulk of the many fat cells, which increase more and more in the part where there is the least resistance, especially if compression, or any obstruction be added; either of the small veins that carry back the fat from those cells, or even of the foramina by which it is transmitted into the neighbouring cells, affords us an easy method of accounting for the origin of these excrescences whereof we speak, and their vast increase also; the very weight of the fat, for instance, relaxing every day more and more both the cells and the skin: for which reason still other and other cells, upon the removal of the former resistance, expand themselves, and are enlarg'd in a surprizing manner.

How much the removal of resistance contributes to the enlargement even of fat tumours, those two in particular which I spoke of just now (*z*), as describ'd by those celebrated men Jo. George Hoyer and Elias Camerarius, show. For the skin being eroded, or incis'd, by mountebanks, and almost all their adipose substance, or at least a very considerable part of it, being taken away, these tumours began to be enlarg'd in a surprizing manner, and had a very speedy increase in their substances of this kind; as you will learn from the histories of both.

However, although in speaking of the membrana adiposa itself, I have mention'd nothing of it in this place, but its cells; I did not, for that reason, mean to determine any thing in relation to its structure. For whether you should chuse to call any of the larger parts of that membrane sacculi, or lobes,

(*u*) Eph. N. C. Dec. 3. A. 7, & 8. Obs. 183.

(*x*) Dec. ead. A. 5, & 6. Obs. 41.

(*y*) N. 3.

(*z*) N. 24.

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and the lesser parts lobules, and, in fine, very small cells, or kernel-like bodies; or whether you chuse to comprehend all these under one term of cells, or to call them membranous *revolutions and complications*, or even membranous laminæ variously inclin'd to each other; it will equally tend to give you a just conception of the matter: and you will find authors, who are by no means contemptible, speaking of each of these modes of structure. For the fourth is from an illustrious anatomist among the more modern; the third from our Sanctorius (*a*), who by this means led the way, as it were, to those modes which we have from the others; the second was made use of by Glisson (*b*), though he had not as yet, in my opinion, seen that of Malpighi, when he wrote, nor yet Malpighi that of Glisson, as I believe Malpighi publish'd his (*c*) before the other; and his was almost the same as that which was pointed out in the first place by me.

And that, if you please, you may follow: for what forbids us to divide the larger parts into smaller, and these into very small? especially as Malpighi has, if I remember rightly, no-where expressly denied, that these parts have communication with each other, and with the rest; nor has taught that the membranous "sacculi, or lobuli," have an oval figure, but "almost oval;" and even "that they are differently figur'd, and are like the small lobes of which the lungs are also compos'd:" and of how different forms these lobules are, appears from the figures that he join'd to his epistles of the lungs. And he had, moreover, written this before, "that in a sacculus were contain'd very small lobules of a very different figure, fill'd with fat."

However, to return to excrescences of that kind which I have spoken of; that some excrescences, very similar to them, exist not only in the adipose membrane, but also in other internal membranes, and particularly in the omentum, is shown by an observation which is transferr'd into the *Bibliotheca Anatomica* (*d*), of innumerable processes, an inch in thickness, and four or five inches in length, that hung from the adipose parts of the omentum, being also turgid with the same kind of half-concreted oleose fluid that the other adipose membranes are. But omitting these more internal tumours, let us go on to speak of those which fall under the notice of the hands and eyes, as the intention of this letter requires.

26. But although, for the sake of some order, I shall speak of those tumours that remain in such a manner as to follow their situation, rather than their nature; that is, to begin with those which occur in the head and the neck, and after that to descend to the inferior parts; I would not, however, have you expect that I here take notice of the venereal "gummata," which discover themselves there, and in other parts; as I shall, with more propriety, reserve the consideration of them till we come to consider the venereal lues (*e*); and much less that I here repeat what I have already written (*f*) on the hydrocephalus, or on the polyp of the nostrils (*g*).

As to tumours of the tongue, I have, indeed, seen many of them; but

(a) Comment. in I. Fen Avic. Quæst. 55.

(b) Traët. de Partib. Continent. c. 11, &

15. (c) Exercit. de Omento, Pingued. & cæt.

(d) Tom. 1. P. 1. in Adnot. ad cit. Malp. Exercit.

(e) Epist. 58.

(g) Epist. 14.

(f) Epist. 12.

never have had opportunity of examining any by dissection. Yet among those I have seen, I am not willing to omit, in this place, some very small tubercles, like warts, on the upper surface of it, very near to the basis, which were formerly shown to me by a surgeon, in a woman of Padua, in order to take my advice in regard to the proper method of extirpating them. I was not ignorant that Marcellus Donatus (*b*) had mention'd verrucæ, or warts, of the tongue, as a very rare case, and what had been seen by him but twice in the whole course of his life. For which reason, I was the more attentive to examine them, while the woman thrust forth her tongue, and the surgeon depress'd it. And, indeed, nothing could be more like warts in appearance; but, in fact, those tubercles were nothing more than the last and largest of all the papillæ, as the situation and position of them immediately shew'd; being diseas'd only in this one respect, that, as this part of the tongue was affected with a phlogosis, they were also become somewhat thicker and higher than usual, and protuberated.

I desir'd, therefore, both the woman and the surgeon to be of good courage, and gave him no other advice in regard to these tubercles, when I conferr'd with him, but that he should frequent anatomical demonstrations; by the neglect of which it happens more frequently than you imagine, that the appearances which are natural are consider'd as morbid; just as when those foramina that naturally open in the neighbouring tonsils are taken for ulcers.

The tonsils, however, I have more than once dissected in dead bodies, either when tumid from a present inflammation, or from one that had preceded.

But I never was willing to persuade any one to have them taken away with the knife, when they were become hard, and growing out into scirrhus tumours; not because I was ignorant that they might be taken out, but because I could not be sure that other surgeons would make use of the same dexterity and felicity, in this operation, as some very experienc'd surgeons have done, and in particular Benevoli (*i*); especially as I am very well inform'd in how much danger some of those who have undergone the operation of extirpating the tonsils have been, on account of a very great effusion of blood, which has not been stopp'd, at length, but with difficulty.

And I was very glad when I heard that very prudent and learned physician Francesco Serao say, in a conference with me, that he us'd to behave in nearly the same manner; that is, to propose, on the one hand, the successful instances of their extirpation, many of which he had seen; and, on the other hand, the examples wherein there had been great fear and danger, which he likewise was not ignorant of: and then leave to the discretion of those who consulted him what they would do, without interposing any judgment or persuasion of his own.

Yet those surgeons better deserve to be forgiven, who, when they see that passage which is necessary for speaking, swallowing, and breathing, already become very narrow, by reason of a scirrhus tumour of both the tonsils, and all other remedies of no effect, fearing that it will be every day more narrow, are bold enough to precipitate the patient into a present danger, in

(*b*) De Medic. Hist. Mirab. l. 3. c. 5.

(*i*) Osservaz. 12.

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order to avoid a future one; better deserve, I say, to be forgiven, than they who undertake to extirpate a wart, or any other harmless tubercle of that kind, from the face, especially if it be congenial and livid; not attending to what Arantius (*k*) has admonish'd us of, that if the case succeed well, very small reputation is acquir'd thereby, as from a case of very small importance; but that great infamy and reproach are the consequences, if, which frequently and easily happens, the most violent disorders are excited even from a slight irritation of the face: I say, of the face; inasmuch as I saw a case which happen'd, not from the extirpation of a tubercle of this kind from the skin of the nose or lips, but from the skin of the cheek, and that to the great disgrace of the surgeon. At first, indeed, there was only a slight ulcer; but this could not be brought to a cicatrix, though in a priest who was in other respects in very good health; and this at length degenerated into a large cancerous and incurable ulcer, in which state I saw it; so that the whole cheek was entirely consum'd, and the patient kill'd by the most severe and excruciating pains. Yet the surgeon had taken off this tubercle by the knife: and this I say, that you may be less surpriz'd to read of a much larger cancerous ulcer having been the consequence, when another surgeon had undertaken to remove a wart of the face (*l*) by "caustic" remedies.

27. But as to what I saw, by dissection, in a recent and large tumour that occupied the cheek, and the parts that are below the chin and the ear (*m*); or in another less recent, that had been form'd behind the ear (*n*); or what kind of matter I found in the parotid gland; and into what a hardness it degenerated by stagnation; has been sufficiently said on a former occasion (*o*). But what makes that tumour in the same gland, which we call the *parotis*, and which every one knows to happen often in the height of an acute disease, while the event of it is yet doubtful; though sometimes it happens even in those who are upon the recovery, and such as are taken up from the bed, and that with success; as it never yet happen'd to me to dissect it, I cannot certainly say: yet you will, perhaps, conjecture, that it may sometimes be brought on from a fluid, which rather distends the common integuments of the gland, than the gland itself; and conjecture it in consequence of what I have taken notice of, as having been seen by me, when describing that tumour which was mention'd in the first place, especially where the gland, after the suppuration and cure of the tumour, performs its office properly as before.

And that the gland itself grows gradually tumid sometimes, without any preceding fever, and becomes hard, just as the other glands that lie lower in the neck do, when they grow large and strumous, is too well known to all physicians and surgeons; to whom they generally create a good deal of trouble. Yet sometimes they are resolv'd much more easily than could be expected. Thus in a Venetian girl of seven years of age, I remember that it had become very hard, and extremely tumid, and could not be touch'd without pain; yet that the whole of the matter which had stagnated there, was

(*k*) De Tumorib. p. n. c. 23. & 31.

(*l*) Eph. N. C. Cent. 5. Obs. 35.

(*m*) Épist. 4. n. 24.

(*n*) Ep. 14. n. 3.

(*o*) Ep. 11. n. 15.

entirely,

entirely, though slowly, discuss'd; and that the gland return'd to its natural proportion, merely by the help of anointing it with the *Oleum Philosephicum*.

But in regard to strumas, I have heard our Vallisneri more than once assert, that when a poor woman had brought to him her child, who was a very young girl, and strumous; he, in consequence of her poverty, had prescribed nothing to be taken but a small wine, in which the insects call'd *foros* were macerated; and the woman had even always put more of them into the wine than he order'd, and by that means excited a great flow of urine; and that she return'd with her daughter a month after, who was perfectly cur'd, to his very great surprize.

These remedies, however, I do not make mention of as being unknown; but rather because they are so very well known, and, for that reason, despis'd by some; whereas they nevertheless may sometimes, and particularly in a tender age, when the disease is not very inveterate, be of greater use to the patient than we could hope or expect.

28. Perhaps you will here enquire, whether some things said by Riolanus upon strumæ, in the second book and fifteenth chapter of his *Anthropographia*, are said with propriety and justice. And these are said with justice and propriety: "Nor is it without reason that Julius Pollux, in his *Onomasticon*, has observ'd that strumæ are form'd about the mesentery. On this subject see Philip Ingrassias, in his book of tumours, page two hundred and ninety-nine." But these things, which immediately precede, are not said with justice: "Nor do strumas ever break out externally, unless the mesentery has been strumous. And, for this reason, Guido de Cauliaco very properly derives the source of strumas from the mesentery."

For Guido (*p*), and he who is quoted by him, Arnoldus, says this; that from external strumas, if many in number, the existence of the internal is prov'd. Nor is what Riolanus says universally true; I mean, that the struma never appears outwardly, unless there are others in the mesentery: and that is deservedly disapprov'd by Thomas Bartholin (*q*). Against whom Riolanus is not well defended in this section of the *Sepulchretum* (*r*), as if he had said no more than what is said by Guido; that is, if the external strumæ are "in great number." For Riolanus has added this in his *Encheiridion* (*s*), and even has more contracted, in that work, what he had before said in his *Anthropographia*, by saying, that strumas "rarely appear externally in great numbers, unless they have their roots seated in the mesentery." Bartholin, however, did not refer to the *Encheiridion*, but to the *Anthropographia*; as others have also done; and among these Schelhammer (*t*); and before him Scultetus. Who, as you see from the *Sepulchretum* itself (*u*), attributed this universal opinion to Riolanus; and added, "which even Guido and Ingrassias bear testimony to."

(*p*) Chirurg. tr. 2. doct. 1. c. 4.

(*q*) Anat. quart. renov. l. 1. c. 12.

(*r*) Obs. 6. Schol. ad §. 4.

(*s*) l. 2. c. 18.

(*t*) De hum. corp. Tumorib. S. 2. P. 1. n. 78.

(*u*) Obs. cit. §. 9.

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What the first of these authors has asserted, I have already told you ; and Ingrassias is not even said to have asserted this by Riolanus ; but it is quoted as relating the opinion of Pollux, (which is quite different) and confirming it ; that is to say, “ that strumas are also form’d about the mesentery ;” which Schelhammer and Scultetus would have known, as Riolanus admonishes, by inspecting the book of Ingrassias, and he who added the scholium of this observation in the Sepulchretum ; in whom, in other respects, there is no reason why we should require this diligence, since neither the passage of Scultetus is accurately copied, nor is the chapter of Riolanus rightly put down ; but the fifth instead of the fifteenth ; and the thirty-ninth observation of Scultetus instead of the thirty-first.

Some years ago I saw a noble youth that might have been compar’d with him describ’d in the Sepulchretum by Platerus (*x*), by reason of the number of his external strumas, and the various, but always useless, methods of cure, that had been made use of ; who in the first year, however, had no mark of the mesentery being affected in the same manner. But neither Platerus examin’d the belly of his patient, though he had it in his power ; nor I of mine, as he at length died at some distance from hence.

Yet this which I shall immediately subjoin, and which is sufficient against what is pronounc’d by Riolanus in his Anthropographia, I remember to have seen in another body.

29. A young man had died in this hospital, about the beginning of November, in the year 1715, from the effects of strumous tumours, which beset his neck.

Being led, by the desire of anatomical researches, to dissect some other parts, and among them the mesentery, I not only found no struma in them, but even no indurated glands : and although they seem’d to be a little larger than they generally are, I suppos’d this to be owing rather to the age (*y*) of the patient, for he was very young, than to disease.

30. That tumours of the thyroid gland ought to be entirely referr’d to the class of strumas of the neck, and that they are improperly call’d bronchoceles, is affirm’d by John Freind (*z*) ; who acknowledges many kinds of these, but all on the outside of that gland ; and amongst them one that is similar to an aneurism ; to which, therefore, the scalpel ought not to be applied. But John Riolanus (*a*), before Schelhammer (*b*), who thought himself to be the first that had observ’d this, classes among bronchoceles, which he supposes to differ “ widely from strumas,” the thyroid gland, “ in a more “ extended state, which produces a sarcoma ;” nor does he mention any one among them that is similar to an aneurism.

For I would have you take care how you suppose that the example which is immediately subjoin’d to this passage of Riolanus, in the Sepulchretum (*c*), of a bronchocele of that kind, which was very similar to an aneurism, unless it was rather a real aneurism, belongs to the same author ; that is, to Riolanus, or perhaps to Parey ; both of whose words and observations had been just

(*x*) Obs. ead. §. 3.

(*a*) Encheir. Anat. l. 4. c. 7.

(*b*) l. cit. S. & P. ead. n. 83.

(*c*) Sect. hac 2. Obs. 5. §. 2.

not. 2.

(*z*) Hist. Medic. ubi de Albucasi.

before quoted. But if you ask to whom then that example, and the two which follow next (*d*), belong, read Severinus (*e*); and you will find that those three instances are describ'd from him, though with great negligence; and that he has expressly plac'd the last in the class of aneurisms themselves.

To me, however, it has always happen'd, that, among the great number of swell'd necks, suppos'd to be affected with a bronchocele, which I have dissected, I always found the disorder in the thyroid gland; even when there was a cavity similar to that of an aneurism; or one, at least, which was full of blood. But as these observations of mine, of the various and manifold disorder in that gland, when tumid, are already extant in the ninth of the *Epistole Anatomicæ* (*f*), there is no occasion to repeat them here. Moreover, you have others in other letters which I have sent to you (*g*); and I shall add some here; from which you may more and more understand, how various the disorders of that gland are; or, at least, of what nature the beginnings of this disorder are.

31. A woman, whose body was dissected in this college, in the year 1741, the remainder of whose history I shall send to you when I treat of the gout (*b*), had the thyroid gland much thicker than it naturally is, roundish in its figure, and universally conglobated into itself. In cutting into it I found it to be hard, and even scirrhus; a white substance being here and there interpos'd betwixt a substance which was of a fleshy colour, degenerating into brown.

32. As I was dissecting the head and neck of another woman, in the same place, and the same year, I observ'd the gland we are speaking of to be somewhat hard at the lower part of the left lobe; cutting both lobes asunder, therefore, longitudinally, I saw many and pretty large portions of a white substance intermix'd with both, and particularly the right; and in the other, in which I have said there was a part somewhat hard, I saw a cyst included, made up of a thick and white coat, wherein a yellow humour, somewhat dense in its consistence, was contain'd.

33. A man, whose head and neck were dissected there about the same time, had one lobe of the thyroid gland larger than the other, and considerably higher. When I examin'd with great attention the upper part of that lobe, which was very hard; I observ'd a membranous bladder, of the form of a very round globe, to be half-buried in it: and this bladder being perforated, a humour of a viscid nature and a yellow colour, so as to resemble bile, was discharg'd.

34. The larynx of a woman was prepar'd for demonstration in the same place, in the year 1744. The same gland being taken out, and being larger and more turgid than it generally is, show'd certain globules, which were in one part of them protuberant, and in the other part buried within the glandular substance, being all of a round form, but of different magnitudes from each other. The largest was equal to the size of a grape: the others were much less. When the coat of these globules was punctur'd, a fluid, like

(*d*) § 3, & 4.

(*e*) De recond. Abscess. nat. J. 4. c. 6, & 7.

(*f*) N. 38. & seq.

(*g*) Epist. 16. n. 38. Epist. 23. n. 4. Epist.

26. n. 21. & Epist. 34. n. 15.

(*b*) Epist. 57. n. 2.

water, and without any colour, came forth. But the largest was of a far different kind; for it was made up of a firm substance, as I perceiv'd by dissection, not much unlike that of which the conglobated glands consist, but of a reddish colour, degenerating into a dirty white, except where it was here and there distinguish'd with small spots of black blood, as it were, and in some places with very small cavities that contain'd nothing.

35. Another woman, who was dissected a little after that, but in the hospital, had in the thyroid gland, at the basis of the right lobe, a small white body of the bigness of a vetch, and in some measure of the form, being a little prominent on the outside of the gland: and in cutting into this body, I found it rather to be bony than cartilaginous.

36. A young man having died of an ascites, his head and neck, as no better could be then procur'd, were brought into the theatre, in order to finish the public anatomical demonstrations of the year 1747. In which, though the other parts were in a pretty natural state, the gland that I have so often spoken of was thicker than it generally is, and, at the lower part of one of its lobes, even harder. In this place, when dissected, I saw that it consisted of round vesicles, as it were, full of mucus. The remaining substance, if you examin'd it externally, represented the gland as divided into pretty large lobes; if internally, into very small lobes, but more than usually distinct.

37. From these observations you perceive, that the tumours of the thyroid gland, or the beginnings of these tumours, happen more frequently to the female sex, than to ours. And this I have also hinted at in the *Epistolæ Anatomicae* (i); and you will conjecture it from the examples of a bronchocele which are transferr'd into the Sepulchretum, first, if you compare them altogether; for you will not only find them in this section of the Sepulchretum, but also in the eighth section of the third book (k), and in the second section of the second book (l), which I wonder that Bonetus should have forgot to mention here, according to his custom; and in the second place, if you set aside those things that rather relate to true aneurisms, which you will very easily find out by comparing them with the books from whence they are taken.

But I suppose it will be of no consequence to compare one of those that are propos'd in the second book, from Moinichenius, for instance; for in this case I should put you in mind that, instead of *Epid.* 77, as it is publish'd in the Sepulchretum, you should read *Epist.* 87; for Moinichenius wrote that to Bartholin at the end of this letter (m). And there would be no need of conjecture, if they who have told us what they found in the bronchocele, had not omitted to take notice in what state they found the thyroid gland: to which, however, I suppose them most frequently to have belong'd; and this not only from some of the author's words, but still more from all the observations I have made quite to the present time.

But I would, likewise, have you examine those that have been publish'd

(i) *Epist.* 9. n. 40.
(k) *Obs.* 31. in fine.

(l) *Obs.* 9. § 1, & 4.
(m) *Vid.* in Bartholini Cent. 2. *Epist. Medic.*

by men of eminence since the second edition of the *Sepulchretum*, Henricus Albertus Nicolai (*n*), Philip Conrade Fabricius (*o*), the French physician Lalouette (*p*), Janus Plancus (*q*), Albertus Haller (*r*), and others; and among these, as I learn from Boeclerus (*s*), Lauthius. That different persons have seen different disorders in the thyroid gland, you will find by reading their observations; but that most of them met with hard bodies of a cartilaginous, bony, or stony nature, and sometimes even found the gland itself become bony, or of a stony nature.

Do not, however, imagine, because there is more than one of them, as well as myself, who have sometimes observ'd these or other disorders in one lobe of the gland only, the other being quite sound; do not, I say, imagine that this gland is not solitary, but consists really of two; unless you chuse to suspect the same of the spleen or the liver, when one part of them is seiz'd with a disease, though the other is sound. And still more beware, where you read some disquisitions upon the thyroid gland, lest you are easily allur'd by the promises which you find in the beginning. But previously read, with attention, whatever is written of this gland, not only in the ninth of the *Epistolæ Anatomicae* (*t*), but also in those passages that the same epistle refers to of the first, fourth, and sixth *Adversaria*; and then, at length, read over those disquisitions also.

You will, indeed, commend, in concert with me, the design of the author, and his endeavour to promote and illustrate that suspicion of mine, of many but very slender tubuli going from the thyroid gland, and terminating in the larynx. But you will wish, at the same time, that he had conjectur'd these to be far different from lymphæducts, bearing in mind the office and structure thereof: and, in other things, that what is mine he would attribute to me; that what is not mine he would not attribute to me; as, for example's sake, where I am said to have prohibited the immision of air, or to have rejected the compression of this gland, in order to enquire into the tubuli thereof.

Is not it sufficient to have inspected, though never so slightly, a page or two of that epistle (*u*), in order to show whether I prohibited immision of air? Did I reject the compression of the gland? I admonish'd that this was to be done with caution and gentleness: which was very well understood by that experienc'd man Boecler (*x*), when, dissenting from the author of the *Disquisitiones*, he has said that he was on my side of the question; for, says he, "we could not elevate the rest of the vesicles, (and even then not all of them) except by strongly inflating one; so that we suppose the air to have made a way from hence into the cellular membrane, by rupturing the vessels, and by this means to have swell'd the whole gland."

And how many times I have made use of the compression of this gland, I have not only not spar'd to declare, but have, moreover, expressly refused

(*n*) Dec. Obs. Illustr. Anat. Obs. 4.

(*o*) Idea Anat. Pract. Sect. 4.

(*p*) Memoir. de Math. & de Phys. présentés à l'Acad. R. des Sc. Tom. 1. pag. 168, 169.

(*q*) Epist. de Monstris & cæt. cum Tab. 3. Fig. 1, & 2.

(*r*) Opusc. Pathol. Obs. 6.

(*s*) Dissert. de Thyroidæa, Thymi & cæt. Functionibus, not. 9. ad § 18.

(*t*) N. 30. & seqq. usque ad 41.

(*u*) N. 36. & 37.

(*x*) Dissert. cit. not. f ad § 8.

the reasoning of those who would attempt to prove it useless. How then is the case? Is it possible that the reason which another advances, and which I soon after reject, has been taken for mine by him who read it in a very cursory manner? Something of this kind, certainly, seems to have drawn into an error another certain person, who, in a kind of anatomical problem, not, perhaps, observing how that is to be understood, in disputations, which is set apart for the sake of *gratification*, as it were, by way of hypothesis, and in the mean while is left as doubtful and undetermin'd; and thinking that I contested against Cowper in that passage, in which I continu'd to defend this very Cowper, did not hesitate to defend him against me; and not only this, but, like an exulting victor, took upon him to subjoin the following words: "Let Morgagni now say what, & *cat.*" Upon reading which words, a friend of mine replied, And what should Morgagni say but what I formerly heard him say, when some young men, who had very often found in the books of learned authors, that Morgagni had observ'd some certain things "after" Berengarius, Falloppius, Arantius, and other anatomists, but were ignorant that these authors were expressly referr'd to by Morgagni in those observations, so as to confess by whom he had profited, and yet to show what he had added to their discoveries; when, therefore, these young men were surpriz'd, that the passages of so many authors which I have quoted had escap'd his eyes or memory; his reply was, I would not have you be too hasty in judging.

But of myself I have spoken more than enough, and enough of tumours of the thyroid gland, when I have added this, that they who have remark'd a change of the voice from thence, may have different methods of accounting for this change, either from the influx of fluid into the larynx being obstructed or chang'd, or from the distraction or compression of the adjacent muscles of the larynx, or from the weight that lies on this tube, and the bulk that forces against it: which I have very briefly hinted at in that ninth letter (*y*).

Yet far more violent symptoms may happen from the pressure being too much increas'd, whether this fall upon the jugular veins, from whence the illustrious Haller (*z*) saw a soporific disorder and an apoplexy, or principally confine the aspera arteria, which the same author has observ'd, so that the breath could not be drawn without difficulty: and, indeed, sometimes it could not be drawn at all; as others have observ'd, and Kerckringius (*a*) in preference to the rest, who, mov'd by the suffocation of a miserable woman, blam'd the physicians for having omitted to endeavour, by a diminution and diversion of the humours, to prevent the tumour from increasing so fast, at least, and pressing the aspera arteria against the vertebræ of the neck by its precipitate increase.

38. But now, as I have already written to you of tumours of the jugular glands (*b*), and of those aneurisms in the neck which are real (*c*); come, let us go on to the chest.

In respect to tumours of the breast of women, our Fabricius de Aqua-

(*y*) N. 40.

(*z*) Obs. cit. 6.

(*a*) Obs. ex Sepulchr. supra cit. 9. § 1.

(*b*) Epist. 22. n. 19. & Epist. 29. n. 12.

(*c*) Epist. 26. n. 21.

pendente (*d*) denies, that he had ever seen those which came on at the time of the milk's coming, not perfectly cur'd. Yet the patients frequently suffer various and very troublesome inconveniences, before the abscesses, into which they degenerate, are perfectly heal'd. For which reason it were the more to be wish'd, that there were remedies at hand, by which women, after delivery, who abound with milk, but, for certain reasons, cannot give suck, could safely drive away their milk, before it could be turn'd into abscesses.

There was a physician at Bologna who asserted, that this might be done by suspending a little dried fish, which they call the *hippocampus*, or sea-horse, betwixt the scapulæ, especially, as he himself said, when taken at a certain time; wherefore, as he had two, he said that the one was more efficacious than the other, and willingly lent the most useful of the two to those who ask'd it of him.

Among these was an ingenious young man, who applied to the study of medicine there with me, before the beginning of this century, and had already begun to practise it there: and this gentleman, having tried the effect of that fish upon two women, asserted that it had answer'd in both of them. But hearing nothing of this experiment for thirty years after and more; I, at length, found it spoken of in the posthumous works of our Vallisneri (*e*), who says, that he had made the same experiment often, and that it had succeeded in the same manner: but in the contrary manner, if the woman who desir'd to encrease the quantity of her milk, hung it on the opposite side, that is betwixt her breasts; which, though in like manner affirm'd by that physician of Bologna, the fellow-student of mine, whom I have mention'd, had no opportunity of trying.

I am very sorry that I neither made the enquiry formerly, nor Vallisneri has remark'd, whether the milk which was driven away in this manner, had been, in any point, detrimental to the women; for it might not be injurious at all, if it was driven away gently and gradually: and by this way of acting, the celebrated Degnerus (*f*) has very frequently seen that quicksilver included in a goose-quill, and worn, in the same manner, betwixt the breasts, discusses the milk "without any injury;" and has not only been well-inform'd, that even among the women in Holland, this is "a safe, familiar, and approved" remedy. However, it is certain, that though at the time I am speaking of, this second remedy was unknown to the Italians, the chief physicians at Bologna did not use the first, either because they did not believe its efficacy, or suspected that it might be hurtful.

I therefore remember that Albertini reliev'd the complaint of two noble matrons, when their breasts were so turgid with milk, that they could neither sleep nor move their arms without pain, merely by diverting the milky fluid to the intestines; and that by a clyster, which consisted of nothing else but broth, with some butter dissolv'd in it, and the usual quantity of sugar. And this I take notice of because both of them began to be so reliev'd, and with such surprizing felicity, at the very time of going to stool, that their

(*d*) De Chirurg. Operat. ubi de Chir. Thorac.

(*e*) Opere Tom. 3. P. 4. Saggio Alfab. d' Ist. Med. alla voce Ippocampo.

(*f*) Aët. N. C. Tom. 5. Obs. 149.

breasts afterwards decreasing in their size, neither of them had occasion for any other remedy. And indeed Albertini affirm'd to me in a solemn manner, that by one of them was discharg'd a matter which he himself saw, and which was perfectly similar to milk; so that this case brought into my mind that of the woman in whom, after weaning her child, the tumour of the breast decreas'd, as soon as ever the milk began to discharg'd into the mouth, instead of saliva: which observation, and the explication of it, that may be accommodated to this of Albertini, you will read in Nuck's *Sialographia* (g). But in what manner, in a certain epidemical constitution of lying-in women at Paris, of which the celebrated Malovin (h) has written, as on the third and fourth day after delivery, the breasts not only were not swell'd, but were flaccid; how I say, after death, which happen'd betwixt the fifth and the seventh day, the milk could be found coagulated, and adhering to the external superficies of the intestines; although they seem'd to have been inflam'd, and much affected with pain, and the disease had taken its origin from a diarrhæa, and from the continuance of it; is not easily to be explain'd; unless, perhaps, from that milky serum (which probably being redundant in the blood, was found in other places in some bodies, but in the cavity of the belly of all which were then dissected) the thicker and more viscid parts had subsided, and had adher'd to the subjected intestines.

39. But as to tumours of the breasts, which do not arise at the time of the milk (although Hildanus produces examples even of these (i), and I have seen one, which were form'd at that time, and degenerated into a cancer) notwithstanding our Fabricius (k) asserts, "that he had seldom seen any " which did not emulate the nature of a cancer;" yet, to omit others, and inspect Ludovicus Mercatus (l) alone; you will be abundantly convinc'd, how many different species of tumours occur in the breasts, which do not emulate the nature of a cancer.

But there are even others besides what he describes; as, for instance, that which was observ'd by me in a Venetian virgin, who was forty years of age. This woman, at a time when the menstrua began to flow some days later than usual, frequently us'd to have a tumour bigger than a pigeon's egg, (not unequal, nor changing the colour of the skin, but very hard, and creating pain in the motions of the neighbouring arm) arise in one of her breasts, which was the left; so that if it had occupied the whole of the breast, it would have seem'd to be scarcely at all different from one of those, which are describ'd in the first place by Mercatus. Yet it was not altogether similar to that which they call glandular, as it was not only not cut into little extuberances; but soon after, when the menstrua appear'd, it was immediately reduc'd, without the application of any remedy, and without leaving any traces of it behind.

40. There are tumours also which arise within the breasts, and which, when the menstrual flux is at hand, are wont to be subject to troublesome tensions. These being hard, and distinguish'd into certain knots, as it were,

(g) c. 2.

(h) Mem. de l'Acad. R. des Sc. A. 1746.

(i) Cent. 2. Obs. 78.

(k) loco supra ad n. 38. indicato.

(l) De Mulier. Affect. l. 1. c. 17.

or sometimes occupying the whole gland of the breast, not only continue, but, pains afterwards coming on, seem already to degenerate from a scirrhus nature into that of a cancer. Read those describ'd by the most excellent Trew (*m*), and you will learn how he extirpated them radically, but without the knife, within the period of the revolving year, so that not even the least traces remain'd behind. But there are other tumours sometimes, which, not only by adhering for a long time, and even for a very long time, but also by other marks, emulate the nature of a cancer, and yet are not cancers. To tumours of this kind the following history particularly relates.

41. There was at Padua a nun who had begun, thirty years before, first to labour under tubercles within one of her breasts, which lay at a distance from each other. These tubercles, at length, seem'd to be join'd together into one tumour, in the inferior part of the breast; and had such an inequality of surface, and excited such pains, that made it be universally consider'd as a cancer. Last of all, the pains being greatly encreas'd, the tumour open'd of itself. Then from the manner of its opening itself, from the nature of the matter discharg'd, and from the other appearances, an ingenious and skilful surgeon judg'd it not to be a cancer, and undertook to cure it.

However, the cure never proceeded according to his wish, or expectation, till about the end of the year 1739; when he extracted from the tumour a tuberos body, of the bigness of a walnut, which he brought to me. This body consist'd of many little pieces of bone, some larger, some smaller, dispos'd in no certain or regular order, as I have seen them in the cases of fracture. Betwixt the pieces was interpos'd a substance almost similar to a ligament. This substance, when dried, grew black: but the bony fragments show'd their whiteness. The breast was therefore heal'd up: and although the ulceration return'd, the virgin did not die thereof, but of quite another disease, and at the end of three years after the extraction of that bony body.

42. I suppos'd this body to have had its origin from the coats of the vessels which are given to the breast for the sake of the milk, or of the blood, or from other membranes that had become bony. And from thence, probably, another (which I found, when a young man, in the same bitch in both of whose kidneys, as is already written to you (*n*), I saw calculi) had likewise its origin. Nor will it be foreign to our purpose to produce, on this occasion, observations made upon brute animals; since into this very second section of the Sepulchretum (*o*) is transferr'd an account of tumours, which were found in a calf and a dog.

43. A bitch had one of her dugs, among the rest, more tumid than it ought to be. This bitch being kill'd, I dissected her through curiosity; and under the very teat I found a small roundish body, unequal in its figure, made up of many little bodies, and of more than a cartilaginous hardness.

(*m*) *Commerc. Litter. A.* 1742. Hebd. 52.
a. 2.

(*n*) *Epist.* 42. n. 17.

(*o*) l. 4. Obf. 4 §. 3. & in *Additam.* Obf. 12

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But a matter of a yellow colour, degenerating into lividness, with which two tubercles, of the form and magnitude of a pretty large lentil, that protuberated into the cavity of the stomach, were full, easily yielded to the pressure of the fingers. The cysts of these tubercles were betwixt the fleshy and internal coat. And under the external membrane of the lungs I observ'd, in a certain place, some granules, as it were, of a kind of tartareous matter; which lay at a distance from each other, in several parts. And why these things ought not to be omitted here, I shall immediately say.

44. For as, in the same bitch, I found calculi in both kidneys; besides a very considerable disorder in one of them, which I just now put you in mind of; I did not think it proper to conceal the matter in the lungs, which was already of a tartareous nature; and that in the stomach likewise, which would perhaps have been of the same kind: so that if you should be disposed to suspect, that the body which lay under the teat was of the same matter, in consequence of its abounding so much in the body, rather than of a bony nature, you are at liberty for me to suspect it: although neither in the bitch, nor in that nun (*p*), did it seem to me to be tartareous; and there is extant in the Sepulchretum (*q*), an example of another nun, in whom the breasts, as far as appear'd from one of them, were found to be "universally bony," the skin only excepted.

Yet, as it is controverted even in respect to the arteries themselves, as I have taken notice to you in former letters (*r*), whether that which seems to be bony, be really bony, or only tartareous; and as, in the cases in question, such examinations were not made as are sufficient to show clearly of what nature the concretions in those tumours were; I will so much the more readily leave it undetermin'd; because tartareous, or stony concretions, or, as Celsus (*s*) says, "certain bodies similar to stones," are sometimes found in other tumours; as he himself teaches us, and as the Sepulchretum in this section shows (*t*); but particularly in tumours of the breasts: so that in a widow, of whom the celebrated Bassius (*u*) gives the history, the bodies contain'd in these parts, "by their mutual attrition and collision against each other, gave forth a "sound like little stones;" and I myself have seen in a man, a matter similar to indurated lime.

For the breasts of males sometimes grow out into tumours also, as well as those of women; one of which I have read the description of by Bidloo (*x*); and Heister (*y*), who quotes Bidloo, asserts that he also had made a similar observation; and the celebrated Jo. Mart. Wolffius (*z*) has added another; and I once saw the beginning of this disorder in a goldsmith, to whom nothing was of so much service as keeping the arm on that side quiet for a long time together, in the manner prescrib'd by me: and I again saw it in a perfect state, but containing the same kind of matter which I spoke of just now: and in this manner did the case appear.

(*p*) *supra*, n. 41.

(*q*) l. 3. S. 21. in *Additam. Obs.* 61.

(*r*) *Epist.* 27. n. 20. & *seqq.*

(*s*) *De Medic.* l. 7. c. 6.

(*t*) *Obs.* 15. §. 4. & *Obs.* 17. §. 1.

(*u*) *Dec. 2. Obs.* 6.

(*x*) *Dec. 2. Exercit. Anat. Chir.* 5.

(*y*) *Instit. Chir. P. 1. l. 4. c. 17. n. 3.*

(*z*) *Commerc. Litter. A.* 1742. *Hebd.* 44.
n. 2.

45. A noble and learned man, the son of that matron whose diseases and dissection I describ'd to you, when I treated of vomiting (*a*), being in his thirty-first year, had a very small gland, as it were, begin to be prominent in the upper part of the right breast. This gland, increasing gradually, within about a year grew out into a tumour of the bigness of a fist, and very hard, but wanting all the peculiar marks of a deprav'd nature.

This tumour, about the beginning of the year 1742, and in the fourteenth month from the time of its beginning, spontaneously open'd itself; and show'd within the cortex, or shell, that was made up of the integuments, and fleshy fibres, nothing but a matter which, in some places, resembled a hard calcareous concretion, and in others, a softer concretion of the same kind.

46. I then even saw and touch'd this matter, as it lay within the gaping tumour, being call'd into consultation upon the case, together with some other professors of the college.

As his father and grand-father had been greatly subject to the gout, but this patient never, except that sometimes he had just observ'd a slight and short pain in the great toe of one foot; it seem'd reasonable to all of us to suppose, that the tartareous matter, which in them had fall'n upon the mucilaginous glands of the joints, had, in this gentleman, fall'n upon the mammary glands; perhaps because the other parts, being very firm, had given too great resistance; and this the more easily, as I observ'd the sternum, when it had scarcely measur'd a third of its length from the upper part, to subside suddenly, and in a great degree; for which reason I conjectur'd that, in consequence of the mammary vessels being inflected in an angle here, at the sides of the sternum, the motion of the blood through the breasts was become very slow.

But this opinion, in regard to the gouty matter of that tumour (which was so much the more probable, because Preussius (*b*) had seen a gouty matter "in the form of a calx," which could no longer be deposited in the extreme joints of the limbs, come out through an ulcer of the breast) made most of us very cautious in giving our opinion; as we fear'd, for instance, lest when the tumour was cut out, and the seat of it heal'd up, the matter should perhaps turn itself to other and more noble parts; since the observation of Albertini (*c*) had also lately shown, how many tumults had been excited in the constitution, and especially in the belly, by the repulsion of the gouty matter from the lower limbs; which were strengthen'd by anointing them with the *Oleum Petrolei*, till it was, at length, discharg'd by the way of the intestines, in such a manner, that it was surprizing "what, and how many," concretions, made up of lime, or of gypsum lately cemented, and nearly "similar to the matter from whence the gout is produc'd," were discharg'd that way.

Since, therefore, for these reasons, the advice of those who were for waiting did not at first displease, and the matter was gradually taken away from the tumour; behold a new fever came on; and to that matter which re-

(*a*) Epist. 30. n. 7.

(*b*) Eph. N. C. Cent. 3. Obs. 17.

(*c*) Comment. de Bonon. Sc. Acad. Tom. 1. in Opusc. ubi de Cortice Peruv.

main'd, a new matter of the same kind was, in fact, added. After this, however, the patient being quite wearied out with waiting, committed himself to the care of a resolute surgeon; by whom, as the patient himself earnestly desir'd, the tumour being entirely cut out, and the wound brought to a cicatrix without any difficulty, he so far recover'd as to be seiz'd with no disorder afterwards that I know of: so successful, sometimes, in medicine is an unreasonable boldness.

47. To what kind of tumours those parts of the breasts which were harder than natural, and which, though a brown, green, and black humour was express'd, I found to be pretty sound to appearance, in that dissection which was describ'd to you in the twenty-first letter, under number forty seven; I say, to what kind of tumours these belong'd, or rather would have belong'd, if the woman had liv'd for a considerable time longer, I cannot easily determine.

For although you might then refer those tumours only to that humour which distended the lactiferous vessels, yet who can for a certainty affirm, that a humour so very preternatural and deprav'd would not have produc'd some tumours of a very bad nature, by its long confinement there? Indeed, I have read of women that were seen by Riverius (*d*), and by Lanzonus (*e*), from whose breasts a green milk was discharg'd; and two are spoken of in the *Ephemerides Naturæ Curiosæ* (*f*), and in the *Commercium Litterarium* (*g*), one of which had black and very acid milk; and the other, as often as she pleas'd, could press out of both breasts "a kind of very thick fluid, of a colour extremely black;" and this being receiv'd upon linnen rags, within twenty-four hours "became green like verdigrease, and at the same time seemingly put on a corrosive nature."

But although I see that most of these women were not at all healthy, yet I do not know what was the end of any one of them; and whether the breasts in particular, if either the milk did not flow out, or what remain'd of this kind of humour was not press'd out, were seiz'd with any pain, or, finally, with any tumour of a malignant nature.

You perceive that at present I speak of the cancer, a tumour which is so often form'd, and especially in the breasts, and which is a case the malignity whereof is as evident as the cure is difficult: so that Johannes Bapt. Cor-tesius (*), when he wanted to show "how far it does not always follow, that a disease which is known may be immediately cur'd;" and this "chiefly on account of its malignity;" has, with great propriety, made use of the cancer in particular, as an example, "which, although it be known by all, is, nevertheless, seldom cur'd by any."

Indeed, it does but rarely happen that the cure is in every respect happy. And I have very often seen those consequences which Celsus (*b*) has foretold; that whether it be cut out by the most experienc'd and skilful surgeons, "it has, nevertheless, return'd after the wound was cicatriz'd," in the same or some other place; or any other persons "have made use of caustic appli-

(*d*) Cent. 2. Obs. Medic. 100.
 (*e*) Animadvers. var. ad Medic. & cæt. 125.
 (*f*) Dec. 2. A. 4 Append. n. 5. XLIII.

(*g*) A. 1734. Hæbd. 1. n. 1.
 (*) Miscell. Medic. Epist. 6.
 (*b*) De Medic. L. 5. c. 28.

"cations," and put the poor women to the most severe torture for a long time together, that the event of these cases has been worse, or, at least, not better.

For there was, even amongst us, before the volume of the Memoirs of the Royal Society at Paris, for the year 1739, came out, a person who, by the application of a caustic herb, was said to destroy cancers radically. But whether this was the *dentellaria* of Rondeletius, as we conjectur'd from some marks; for the person himself conceal'd it as much as he possibly could; or whether it was any other, the man at first got himself a great reputation, as is frequently the case; but the success of his cures not corresponding to his fame, he was soon after deserted.

Whether it has continu'd to answer among the inhabitants of Montpelier, I am ignorant: among us, at least, physicians and surgeons are more confirm'd in their opinion of preferring excision by the knife, when they are at length overcome by the entreaties of the patients (who do not at all consider those things that have been said above (*i*)) and compell'd to undertake the cure; since, if this method be not attended with a less severe pain, that pain is at least shorter in its continuance: so that by this means the prolonging of life, at least, if not life itself, costs the patients less, although the cancer should return afterwards; and they are free, in the mean while, from the continual and excruciating tortures of a very filthy disease.

But I forbear to say at present, how many, and what circumstances are requir'd in patients, in order to give us reasonable hopes that their life may be prolong'd. Some of these requisites, and, in like manner, many circumstances diametrically opposite thereto, you will collect from an observation which I shall give you here in particular, though I might have given it on other occasions. For from the same observation you will see what was the structure of a scirrhus degenerating into a cancer; and will, at the same time, see it confirm'd, "that a contusion, which would be of no importance in "the skin," may, to use the words of Boerhaave (*k*), "produce the worst of "scirrhi in a conglomerated gland;" and, in like manner, "that a cancer is "with great difficulty cur'd in a melancholic woman."

For there are, even among us, some women of this temperament; but they are not all so: nor can I conceive who could impose upon that great man in such a manner as to assert (*l*), "that the Italians, to the eighteenth year of "their lives, were lively and playful; but that after the thirtieth year they "all became sad, morose, melancholy, and afflicted with the piles." However, this observation was communicated to me, some years ago, by that learned and respectable man Jo. Bapt. Charburi, formerly my much-esteem'd auditor, but now first regius professor of the practice of medicine at Turin.

48. A rustic woman, about fifty years of age, happen'd to have a blow upon her left breast: and therein, after near a month, a tumour discover'd itself, which they in vain hop'd to have dissolv'd by fomentations, or prevented from growing larger by the compression of a hollow plate of lead. For it increas'd in such a manner, that within the seventh month after receiving

(i) N. 16.

(k) Prælect. in Instit. § 903.

(l) Ibid. ad § 897.

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the blow, from the upper, and at the same time from the external part of the breast, where it was much thicker, harder, and of a more irregular figure, it now descended below the areola: the nipple of which lay hid, almost universally, among some transverse rugæ.

Under the neighbouring axilla, other rugæ, similar to these, were observ'd: there was a pain at the axilla, when the shoulder was lifted up; and the whole of that limb was affected with an œdematous tumour. Which circumstances, and, besides these, the adust and melancholic temperature of the woman, were immediately repugnant to the opinion of those who propos'd the excision of the tumour. On the contrary, the robust body of the woman, and her intrepid mind, which was prepar'd to undergo the operation, were favourable to their proposal; which was, moreover, urg'd by other things, but in particular by this, that the pungent pains, which increas'd upon the patient in proportion as the tumour had increas'd, were now become extremely more violent, and were attended with almost continual watchings.

The excision of the tumour was, therefore, undertaken; and what appearances this had internally, will be said below. The operation seem'd to have been perform'd successfully, and according to the opinion of those who propos'd it, till the seventh day, at which time the wound was always of a lively colour, and soft. But after this time it was seiz'd with an inflammation and corruption, which not only consum'd all the cellular part of the breast that remain'd, but that part of the pectoral muscle, also, which lay beneath the breast, and that part both of the external and internal intercostals which was opposite thereto; so that the pleura appear'd to be naked, betwixt the ribs, in that part, to the extent of about five inches, that is, from the sternum transversely.

However, the ulcer was at length cleans'd, and for five days was soft; at which time there was a laudable pus; and the pulse was not quick, except in the evening, and this only for a few hours; all the other circumstances being nearly in their natural state, if you except an obstinate costiveness of the belly, which was now-and-then obviated by clysters.

But after those days, every thing chang'd for the worse. The ulcer, in which was seen the cartilage of the fourth rib, of a black colour, and in a manner disjoin'd from the sternum, grew dry, and discharg'd a small quantity of an ichorous pus, which had a very disagreeable smell: and the œdematous tumour of the neighbouring limb, which had lost its motion, and almost its sensation likewise, on the first days after the excision, except that both of them continu'd in the hand nevertheless, was increas'd: the lower limbs were also swell'd in the same manner: and, at the same time, the frequency of the pulse, the thirst, and the watchings, were increas'd. To these symptoms were added a diarrhœa, a loss of appetite for food, a decay of strength, a perpetual sleepiness, a difficult and frequent respiration. And, finally, the last-mention'd symptoms were succeeded by four long febrile paroxysms, which were violent, and join'd with a rigor; one following the other at the interval of about ten hours: and by these the woman was carried off.

The body was every-where flaccid and lax; yet the lower limbs, even when the integuments were cut into, had no remains of the œdematous tumour.

The

The belly had all the viscera of its cavity in a tolerably sound and natural state, if you except the spleen being a little larger than is natural, blacker, and more lax; and, on the other hand, the uterus being very hard, and giving resistance to the knife.

Both the cavities of the thorax were almost full of water, but particularly the left: and therein the lungs, on the side which corresponded to the ulcer, were dry, and almost scirrhus, adhering closely to the pleura in that part, which adher'd much more closely to the ribs, and was become callous, as it were, in that place where it had been expos'd to the external air. Then examining the heart, the cavities on the right side of which contain'd something polypous, we return'd to the external parts: and all the axillary glands on the left side were found, not only to be somewhat thicken'd, but also to be chang'd into a heap of scirrhus tubercles, of a very great firmness, and a livid colour; and this was contain'd in the neighbouring cellular membrane, which was itself, also, converted into a hard steatoma.

And from these tumours, whereby the neighbouring vessels and nerves were compress'd, was understood the cause both of the imperfect paralysis and the obstinate *oedema* under which that limb had labour'd, and also of the pain at the axilla when the shoulder was lifted up; and, finally, of the imminent danger lest another tumour, of a very bad nature, should grow out under the axilla after the former had been amputated from the breast.

This tumour, being examin'd immediately after the excision, and after the fat which adher'd to it was taken away, was found to be of a figure approaching to an oval, the larger axis of which was equal to about an inch and a half. With this tumour were continu'd three or four others, of different magnitudes, but all small. At the center of these and of the former, blood which was putrid, and of a pale colour, was found: and this blood was surrounded by a matter of a middle nature betwixt puriform and sebaceous.

49. Some things which were observ'd with accuracy and skill, during the respiration of the woman, in the pleura, in the ribs, and part of the intercostal muscles, when these lay expos'd, I have pass'd by, not because these circumstances were less worthy of notice, but because they do not immediately relate to the intention of this letter. But that history which is describ'd by Gahrlepius (*m*), is one of the first that relates to the subject of this letter, as it has many circumstances which may be compar'd with that I just now gave you, and this, moreover, which was found in the dissection of the body; I mean, that the cancer which had been cut out from one breast, "had propagated its virus from thence to the other breast, also, in a transverse direction, over the bone of the sternum;" and this in a latent manner, so that nobody suspected it during the life of the woman.

But now, as we are hastening on to the remaining tumours both of the thorax and the belly, that which I saw in the clavicle, I think, may with more propriety be deferr'd till I treat of exostoses below (*n*). And as to those which relate to aneurisms of the great artery, that raise up the parietes of

(*m*) Eph. N. C. Dec. 3. A. 5, & 6. Obs. 163.

(*n*) Vid. n. 58.

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the thorax or abdomen, as they have been already sufficiently spoken of (*o*) by me, when I treated of the internal diseases whereto they belong, I am not at leisure here to repeat them, in imitation of the Sepulchretum.

And indeed, if by chance, as in the living cook I distinguish'd an aneurism of an intercostal artery, from the pulsation being very much produc'd in the longitudinal direction of the artery, and the transverse direction of the body, but never equalling the whole interval, which was betwixt the two ribs in its latitude; so I had also seen that interval rais'd up into a tumour at length, as Lancisi saw it (*p*); and in the body after death, as happen'd three or four times to Ruysch (*q*), had found so small an artery expanded to the size of a hen's egg; I do not know whether I should not have plac'd it among the tumours of the thoracic cavity, rather than among these I am speaking of now; though it would have been more allowable to have done the latter, than, as in the Sepulchretum, to refer to this class, tumours of the viscera themselves, whereby the abdomen is forc'd outwards: of which tumours (*r*), and of the herniæ of the abdomen itself (*s*), and of the hydro-rachitis also (*t*), I have written to you in other letters.

There are, however, now and then, certain tumours of the abdomen, which, although they really belong to the abdomen itself alone, seem to belong to the viscera. One of that kind I saw in a pious and learned priest, prominent in the manner of a large hemisphere. This tumour being open'd, and having discharg'd a great quantity of matter, of a very filthy odour, was observ'd by the surgeon, upon introducing his probe, to penetrate as far inwardly, as it had protuberated outwardly; so that it was generally suppos'd, without any doubt, to belong to some one of the viscera. There was not, however, any discharge of matter which confirm'd this opinion, nor were there any marks of a viscus being injur'd; and finally, the perfect cure of the patient, who liv'd in a very good state of health many years afterwards, clearly shew'd, that what had been collected together in this very large tumour, had, in fact, forc'd inwards, in an incurvated manner, the muscular parietes of the abdomen, and the peritonæum, far into the cavity of the abdomen; but had not perforated them, nor yet brought about a communication betwixt the cavity of the tumour and the cavity of the belly, and much less a communication betwixt the cavity of the tumour and any of the viscera.

50. Tumours of the testes, and the involucra, wherewith they are surrounded, of which I can write somewhat more, you remember have been treated of by me in a former letter (*u*).

But as to those that relate to the penis, anus, and the genital parts of women, although I have seen many of them, yet as I never had any opportunity of dissecting them, there is scarcely any thing for me to hint at. I was present when Valsalva amputated a cancerous tumour into which the glans, and a very large part of the penis adjoining, had grown out. The two cir-

(*o*) Epist. 26. n. 19 & Epist. 40. n. 26.

(*p*) De Aneurysm. l. 2. c. 2. Propos. 28. cujus, & præcedentis titulo ne fallaris, faciet Propos. 25.

(*q*) Thes. Anat. 9. n. 5.

(*r*) Epist. 36. & 39.

(*s*) Epist. 34.

(*t*) Epist. 12.

(*u*) 43.

circumstances which he was afraid might happen, did neither of them happen. One was, lest the very small part of the penis which was to remain behind, should happen to be immediately drawn inwards. And the other was, lest, though the penis should remain in its usual situation, the arteries should be drawn inwards nevertheless. And as he intended, which he really did, to tie these up by passing a needle and thread round them; this operation would have become extremely difficult by either of these circumstances happening.

Against the first-mention'd accident he had before provided: and if the second had happen'd, he then would have been oblig'd to do what he was very unwilling to do. For he always studied to diminish, as much as was in his power, the painful tortures of those whom he cur'd by the knife. For which reason he was not willing to make use of fire in this case, as Scultetus did (x), or leave any of the diseas'd part behind, as the same author did; nor yet apply a tight ligature round the penis, and above the diseas'd part, in such a manner, that whatever was below the ligature might die in a short time: for how much pain is brought on in this case, by such a constriction, the thirtieth observation of Ruysch (y) sufficiently shows.

Yet I would not have you believe, for this reason, that other very experienc'd surgeons, among whom are Heister (x) and Benevoli (a), have preferr'd this method of constriction without very good reasons. For although Valsalva perfectly cur'd this patient of his; yet there was some danger on one of the first nights, by reason of the blood's beginning to open itself a passage, if an attendant who, according to Valsalva's order, lay just at hand, had not very speedily prevented it in the manner that had been previously shown him. This patient was of an advanc'd age.

Another patient was of an advanc'd age also, from whose anus an excrescence, of a very bad kind, and similar to a kidney, both in size and shape, hung down by two depress'd peduncles. This excrescence being taken off by another senior surgeon, when I was a young man, and look'd on, by drawing it down, and cutting the peduncles across; and the lower part of the intestine, from whence they had grown out, having immediately drawn itself upwards, and conceal'd itself both from his hands and eyes; I at first saw that the man was confus'd, as he had expected no such thing, although none had had greater experience than he, and he was really eminent in his art; yet soon after, as no great quantity of blood was discharg'd, his courage being reviv'd, he insert'd a middle-siz'd tent, daub'd over with the white of an egg, and sprinkl'd with powders that have a strong astringent virtue, and departed from the patient.

But scarcely had a quarter of an hour pass'd, before blood began to be discharg'd in a considerable quantity; and what show'd that it had been discharg'd into the cavity of the intestines, in a much greater quantity, the patient began to beg that the tent might be taken away, because he could no longer resist the vehement desire he had of going to stool; and his pulse had sunk in a very great degree. The surgeon being call'd again took away the

(x) Obs. Chir. 60.

(y) Cent. Obs. Anat. Chirurg.

(x) Instit. Chirurg. P. 2. S. 5. c. 132.

(a) Oserv. 27.

tent, and this was follow'd by very large pieces of coagulated blood. Then the surgeon, introducing his finger, compress'd the wound thereby, for a considerable time; nor did he remove it, till a tent was prepar'd to be inserted, daub'd and sprinkl'd over with the same medicines as the former, but much thicker, which ought to have been attended to at first: and by this means the blood was at length, with much difficulty, check'd.

Yet these things I have taken notice of for no other reason, but that you might understand what was the opinion of Valsalva, in regard to the method of amputating the penis, at that time so much controverted; and, in like manner, that every thing which may happen during an operation, is to be well consider'd and provided for, even by the oldest and most experienc'd surgeons. However, in regard to the first method of cure, I would have you read Benivenius (*b*) among the ancient authors: and as to the second, Heister among the more modern authors (*c*); for you will find in both an example of a successful cure.

In regard to condylomata of the vagina in women, there may not only be many causes thereof, but I suspect that one of them is sometimes such a cause as exists from the original formation; and of what kind this is will appear from the following observation.

51. A young virgin, of fifteen years of age, having been, for a long time, in a cachectic habit of body, was at length seiz'd with a very violent disorder, and pass'd the latter days of this disorder, and of her life, in the hospital at Padua, in such a manner, as, to all appearance, to die of an inflammation of the lungs, which happen'd about the end of the year 1750.

When the thorax was open'd, a dropsy of that cavity appear'd; and in the lungs was scarcely any appearance that argu'd a slight inflammation thereof.

The genitals were the principal parts which were taken away from the belly. And though in demonstrating the structure of these parts, I found it, in almost all of them, to be nearly natural; yet these few things, which were preternatural, I did observe. At the foliated extremity of one of the Falloppian Tubes was an hydatid. From the orifice of the urethra a small reddish body was prominent; and this, when cut into longitudinally, I perceiv'd to be nothing else but the internal coat of that meatus, which being universally black above, from the subjected vessels being distended with blood, had inverted itself outwards at the lower part, and become protuberant: and this I remember also to have seen in another woman, of whom I shall write (*d*), when I treat of lameness; and I remember to have taken notice of both, when on the subject of difficulty of urine (*e*), and to have enquir'd into the cause of that little disorder.

The vagina being open'd at length, and being found to be smear'd over with a whitish and thickish humour, I met with that appearance which gave occasion to my writing this observation in the present place. That is to say, near to one side of this cavity, at a finger's breadth above the hymen, the anterior and posterior surface of the vagina were tied to each other by a kind of short band, of a moderate breadth and thickness, made up exactly of the

(*b*) De addit. morb. & sanat. caus. c. 68.

(*c*) Eph. N. C. Cent. 8. Obs. 67.

(*d*) Epist. 56. n. 21.

(*e*) Epist. 42. n. 42.

same substance as the vagina itself, and furnish'd, in the same manner, with a rugous surface; so that it was manifest this connection had existed from the first formation, especially as no trace of foregoing erosion appear'd, either above or below. Before I cut this band asunder, the vagina was very narrow on that side; but when it was divided, this cavity immediately extended itself into a proper breadth.

52. But if this virgin had been married, you naturally conceive that this band must have been ruptur'd, either by the embraces of the husband, or by the birth of the fœtus, and might afterwards have grown out into a condyloma, by being nourish'd in this very moist place. When I dissected this body, at least, it brought to my mind the case of a young married woman, from the orifice of whose vagina I saw two condylomata hang down, after a very difficult birth, similar to this band if it had been ruptur'd in the middle, and had grown out a little after the rupture; and similar even in this circumstance, that they did not arise at a larger interval above that orifice than this band did.

53. Tumours of the limbs still remain to be spoken of. But as almost all these are nearly common to both the upper and lower limbs, I choose chiefly to insist upon those which are seated upon the lower limbs, some of a very large, and some of a moderate size. That was of a large size which distended the thigh of a nobleman to such a degree, and in the manner of an abscess, that Valsalva, who was call'd to undertake the cure, was afraid to open it, in which caution he was very happy; for in a few days the whole of it vanish'd away spontaneously, and the patient recover'd so perfectly, as to live many years afterwards, in a very good state of health; and affirm'd the same frequently to the physicians and surgeons, from whom I had this relation, and even affirm'd it himself to me, who was one of his intimate friends; all of us being surpriz'd whither so great a quantity of matter, which evidently fluctuated under their hands, had been carried, and that without any injury.

But it was suppos'd, that Valsalva had been deterr'd from opening a tumour of that kind, in the first place, by this consideration, lest it should be as difficult to heal it up as it was easy to open it; and in the second place, lest, by reason of the immoderate discharge of matter, the patient should sink, either during the space of a very long cure, or at the very first time of incision; as if it had not been in his power, at that time, only to take away as much as the strength of the patient could bear.

And upon my replying in this manner, I remember that it was ask'd of me, as happens in private conferences, what was the reason that, if a surgeon suffers the whole contents of a very large tumour to be immediately discharg'd, the patients frequently fall into a swoon: and I remember to have answer'd, that some persons chose to attribute this to the blood suddenly rushing into the vessels of that part, in a very great quantity, in consequence of their relaxation, by the weight of the incumbent matter being taken off; so that the quantity which returns to the heart is much less than it ought to be. And in this manner did I answer what appear'd to others rather than to myself; first, because in all tumours, there are not large vessels to be compress'd; and, in the second place, because those neighbouring vessels which

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the uterus compresses when distended with a nine months foetus, are certainly large, and that compression, in a very happy and quick birth, is taken away in a point of time, and yet faintings do not for this reason come on; so that we are under a necessity of seeking out another way of accounting for it, or at least it seems that some other answer ought to be added to the former.

But there are other tumours of the limbs, even still larger than that I have spoken of: which you may in vain desire to open; for what they contain is in great part not fluid, nor can be turn'd into pus; and, indeed, frequently the structure of the muscles that are interpos'd is vitiated, and chang'd to a surprizing degree. You will see some describ'd in a dissertation (*f*) of Jo. Henfelerus, wherein many examples of tumours of the same kind are pointed out; some of which are not so recent but they might have been added to the Sepulchretum, and be join'd to that of Wedelius (*g*), which is omitted in this dissertation.

You will also read of many in a dissertation that had before come out, of Alexander Camerarius (*h*), and some in a volume of the *Diarium Italarum Litteratorum* (*i*), which had been publish'd before either of the other; for, even amongst us, these examples are not very rare, but pretty frequent, and surprizing in their nature. I myself have also seen another in this place, which was large, although not to be compar'd, by any means, with the preceding, wherewith the leg of a nobleman was exceedingly distended. And this I pronounc'd it to no purpose to open, for the reasons just now given: nor was I deceiv'd in the event, as the patient would nevertheless have the tumour open'd afterwards.

However, I cannot be induc'd to believe that the arm of a man, whereof Sancarffanus wrote to Vallisneri (*k*), was turgid with a tumour of this, or of a similar kind; for the primary surgeon having made an incision into it, so great a quantity of blood burst forth therefrom, that the operator was struck with astonishment, and suppos'd the man to be about to die instantly: but the flux of blood ceasing, a serum was discharg'd for many weeks, from the effect of which discharge the arm was reduc'd to its proper bulk; and the man was troubl'd with no inconvenience of the limbs as long as he liv'd, though he liv'd many years.

This case rather brings to my mind that which you read in Xenophon (*l*) and Plutarch (*m*), of Agesilaus, king of the Lacedæmonians, that, as he was ascending, "blood, though from the rupture of what vein is uncertain, flow'd down from his body into the sound leg," for he was lame of the other; "and when the parts about the calf, and the skin, were exceedingly swell'd, and intolerable pains came on, a certain Syracusan physician open'd a vein in the leg near to the ankle; and when the blood had once begun, it continu'd to flow night and day, and, in spite of all their endeavours, they could not restrain this hæmorrhage, till Agesilaus at length fainted away,

(*f*) Hist. brachii prætumidi § 14.

(*g*) Sect. hac 2. Obs. 17. § 3.

(*h*) Hist. pedis tumidi.

(*i*) Tom. 29. art. 4.

(*k*) Opere Tom. 1. P. 6.

(*l*) Rer. Græcar. l. 5. versus fin.

(*m*) in Vita Agesilæi.

"and then the blood ceas'd to flow;" such a state of health being the consequence of it, as confin'd the king to his bed the remaining part of the summer and the whole of the winter. Which case, though in other respects worthy of attention, I do not remember whether any learned physician has consider'd.

It is likewise uncertain from what vessel the blood flow'd, in order to make up two large tumours mention'd by Marcus Aurelius Severinus (*n*), and the famous Albertus Haller (*o*). The one, indeed, had distended "the arm quite to the upper part of the shoulder, and to the anterior part of the thorax which lies about the arm-pits," into such an immense bulk as the figure which is added, and the pain whereof the man died, mutually demonstrate. But the other, having arisen "suddenly after a very great pain, yielding to the touch of the hand, and vanishing away when compress'd," extended itself from the scapula almost to the tenth rib. As to the first, however, we could not so much as suspect what it contain'd, if he had not propos'd it among the number of sanguiferous abscesses, or "aneurisms;" as Severinus says nothing besides those words, and does not seem to have dissected it. But the other we know to have been fill'd with blood, as the man was kill'd by the discharge thereof, not many hours after the incision; and a great quantity was found in the tumour, afterwards, when it was dissected.

However, if it could have been added, in respect to both of the tumours, that they had pulsated in the beginning at least; as in regard to another which contain'd blood, and "cover'd the knee universally," and which was shown to Preusius (*p*) at length, after an interval of some years, this author has slightly hinted; there would have been less room for doubt left to those who might have read the remarks upon bloody tumours communicating with the ruptur'd trunk of some vein, which, as is taken notice of above (*q*), are inserted in Valsalva's treatise of the human ear, and in the thirteenth of my *Epistolæ Anatomicæ*.

54. On the contrary, there are tumours which we have heard are easily cur'd, though in a manner not readily to be explain'd; and this is the reason why I do not think they ought to be pass'd by. A physician of Verona, a man of eminence and reputation, related to me, and to some learned friends, who happen'd to be with me at Venice in the year 1707, the following history. When he was in the place of his nativity, and that very lately, a horse of great value had both his hinder legs swell'd to a very great degree, at the knee-joint, with a watry tumour; but a watry tumour which was hard, and attended with pain: and when no other remedies were of any advantage, that there was a horseleach who promis'd to cure the disease in this manner; that is, he would open the skin a little above the tumour, and having laid bare a vein of a considerable size, which is there, he would tie it up strongly with two ligatures, and would cut it asunder betwixt these two.

This method was, at first, cried out against by every one, and especially by those to whom the circulation of the blood was known, as one which was so

(*n*) De recond. Abscess. nat. l. 4. in fine
Schol. ad c. 7.

(*o*) Opusc. Pathol. Obs. 32. Hist. 2.

(*p*) Eph. N. C. Cent. 3. Obs. 19.

(*q*) N. 2.

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far from being likely to be of utility, that it must even be greatly hurtful. However, as he mention'd that seven or eight horses had been cur'd by him in this manner, and two of them in the same city; and as it appear'd, upon immediately making inquiry into the circumstance, that what he said was true; he was allow'd to perform the operation, which was done in the manner I have describ'd, and in the presence of the person who related the affair to me. The tumours then decreas'd continually, even on the first days after the operation, till at length, within about twenty days, they quite vanish'd away.

And as I happen'd to be making the same relation to some others, among whom was that very ingenious man Dominic Gulielmini, he chose rather to suppose it probable that some nerve was tied up together with the vein, which nerve went to the diseas'd part; and that this nerve, therefore, being cut asunder together with the vein, the pain was by that means taken away; as it might be suppos'd not to have its origin from the tumour, but rather to have given rise thereto: wherefore the force of the stimulus, which, as it had produc'd, might in the same manner continue the tumour, being taken away, the tumour was without difficulty carried off. Be this as it will, I was determin'd not to conceal this cure from you; for it never has done any harm to physicians to know what succeeds with farriers; and perhaps many things have been tried and done by these men, as it is allowable to make experiments upon brute animals, before they were transferr'd to men.

You see, for instance, that Petrus Crescentius, who, when he wrote upon agriculture, four hundred years ago, interspers'd some things relating to the chirurgical part of farriery, has taught us to take blood from a diseas'd ox by incising the veins under the tongue (*r*); or how to receive what was to be given by way of clyster in a kind of bag, the orifice of which is furnish'd with a tube, and to inject it into the belly of a horse (*s*); or in what manner, if blood happen to burst forth from any vein in cutting out a tumid gland from a horse, this is to be immediately stopp'd (*t*), by laying hold of the vein, and tying it up tight with a silk thread. Do you suppose that he did not take those things from more ancient authors? and these from authors still more ancient? so that before Celsus (*u*) and Galen (*x*) taught how to restrain the flux of blood, in parts that are wounded, by throwing a ligature round the wounded artery or vein, this method had, perhaps, been made use of by them while they were extirpating some gland, or while they were endeavouring to cure horses that were wounded in battle.

But whether this method of stopping the blood has been transferr'd from other animals to man, or was first tried on him; I cannot help wondering that, as it has been describ'd in different places, in the books of surgeons, from the times of Galen; and Benivenius had made use of it, among others, in that cure of the amputated penis which was referr'd to above (*y*), “by laying hold of each of its veins which pour'd out blood,” that is to say, the arteries, “and by tying them so as to bring on a coalition of their pre-

(*r*) L. 9. c. 65.
(*s*) Ibid. c. 18.
(*t*) Ibid. c. 16.

(*u*) De Medic. l. 5. c. 26. S. 21.
(*x*) Meth. Med. l. 4. c. 3.
(*y*) N. 50.

"cluded orifices;" I say, I cannot help wondering that there was nobody before Percy (*z*), who thought of transferring this to those wounds which are made in the amputations of the limbs.

But lest you should happen to believe, that they were afraid of the thickness of the arteries that are the principal in the limbs, which bears no comparison with the slenderness of the branches that Galen order'd to be tied; at least, that is the principal trunk in the arm which unskilful men often wound when they think they open only a vein, from whence afterwards, unless great diligence be made use of to resist the beginning, an aneurism arises. And yet that this principal trunk was itself also wont to be tied up with ligatures, in the chirurgical cure of this aneurism, they could not be ignorant, not only from the writings of Aetius (*a*), Paulus (*b*), and Albucasis (*c*), but even from those of much later authors, as Guido de Cauliaco (*d*), and others.

However, I am reminded by the mention of an aneurism in the arm, which was merely accidental, rather to subjoin an observation of an aneurism which was form'd in the ham; not only that I may not recede too far from tumours of the lower limbs, on which I had determin'd chiefly to insist; but also on account of those things which have been said above (*e*) of aneurisms in the ham; a very clear example whereof, describ'd by Hornius (*f*), I have in vain enquir'd after in the Sepulchretum.

55. A builder, or mason, had a very small tumour begin to appear and pulsate in his ham. And this, being neglected, grew to the bigness of an apple. Then many things being prescrib'd by the physicians and surgeons, they were partly of no use, and partly seem'd rather to be injurious, and particularly compression. Wherefore, it had so increas'd within a very few months, as to equal a small melon; and gave the patient the most excruciating pains. To these was added an œdematous tumour of the whole leg and foot, and a tumour of the knee itself in particular. Finally, a gangrene, and soon after a sphacelus, came on. And a rupture being the consequence of this, as had been predicted, a great profusion of blood was brought on, whereby life was immediately taken away; and this happen'd about the end of March, in the year 1740, at which time I was demonstrating some things relative to the anatomy of the brain, to the pupils in the hospital.

In dissecting the brain of this man, at that time, likewise, besides other circumstances which do not relate to the present subject, I observ'd that, notwithstanding he had seem'd to die from a great loss of blood, bloody points, nevertheless, appear'd in the sections of the medullary substance, which even became much larger when I compress'd them laterally: and I also observ'd what seem'd to deserve our attention and admiration; I mean, that when I cut the corpora striata into small pieces, as I generally do, although the scalpel was directed to whatever part I pleas'd, and inclin'd in every direction during the division of the whole of these bodies, I no-where, however, saw any medul-

(*z*) L. 11. c. 24.

(*a*) Tetrab. 4. Serm. 4. c. 40.

(*b*) De Re Med. l. 6. c. 37.

(*c*) Chirurg. P. 2. c. 49.

(*d*) Chirurg. Tr. 2. D. 2. c. 4.

(*e*) N. 10.

(*f*) Epist. de Aneurysm. ad Donzell.

lary striæ, as I have done always at other times; but that, in place of them, a kind of continu'd medullary band, as it were, shew'd itself, which was intercepted on each side, according to the longitudinal direction of those bodies, by the cortical substance: and yet it did not appear that the man had suffer'd any thing unusual in regard to the use of his brain or nerves: and this I would have those gentlemen consider, who are pleas'd with certain offices of these striated bodies which were formerly assign'd to them.

But let us at present omit these things, and go on to the dissection of the ham, which was perform'd by our Mediavia. It is true, a sphacelus had affected all these parts; and yet not in such a manner, but that all the circumstances which I shall mention appear'd very clear. The crural artery began to be dilated immediately upon its passing from the internal side of the thigh to the posterior part. Then, for the extent of some inches, you might have look'd for the trunk of the artery in vain; but the branches, into which it divides itself, at length appear'd in the calf of the leg. Yet in the whole of this tract was there nothing but a very large cavity fill'd with ill-condition'd blood; all the parts being eroded, and even the nerve and vein which are associated with the artery, betwixt the lower processes of the os femoris that are prominent on the back part, being so far consum'd, that scarcely any thing remain'd beside the coats of the vein which adher'd to the bones. But the bones themselves were also in part eroded; that is to say, the posterior surface of those processes I have mention'd, and the upper part of the fibulæ.

§6. But now let us go on from the tumour of the vessels to the tumour of the bones, that is, to the exostosis; and without being, in this letter, at all solicitous with Schelhammer (*g*), whether the exostosis, the sarcoma, the polypus, and other disorders of this kind, are with justice class'd among tumours; nor yet with Bidloo (*h*), whether in a man who is not "healthy in the other parts of his body," a tumour of the bone may not be call'd an exostosis; especially as Goræus (*i*), who is very accurate in determining the proper significations of medical words, expressly says that a polypus "is a tumour," and that exostoses "are tumours frequent even to those who labour under the lues venerea."

However, although I shall not controvert the point with any one, and should chuse rather to comprehend under the name of exostosis, as if under a certain class or species, any tumours of the bones which are preternatural; yet I cannot approve of those who, in enumerating the examples of exostoses, produce, among these, such as it is not certain do belong to the tumours of the bones; or, if this be certain, do not distinguish the exostoses into different species, as it were, with the addition or junction of a peculiar name.

It is not certain and clear, that the monstrous arm, describ'd in the sixty-ninth observation of the fourth century of Hildanus, does belong to the class of bony tumours; so that he himself (*k*) rather thought it ought to be

(*g*) De hum. corp. Tumor. S. 1. n. 3.
(*h*) Dec. 2. Exercit. Anat. Chir. 9.

(*i*) Defin. Medic. in *πολύπους*, & in *Εξέστosis*.
(*k*) Hist. ibid. cit. § 4.

reckon'd among those tumours which I have taken notice of above (*l*), with Henselerus. Yet although Tulpus (*m*) had quoted, in the latter part of one of his observations, that which I have said is extant in Hildanus, and had therein describ'd the os humeri as being in a very bad state, without saying, however, that it was found to be increas'd in bulk; Stalpart (*n*), in treating of exostoses, not only takes notice of that example of Hildanus, but even affirms that Tulpus had there describ'd "an os humeri" which "was much encreas'd in its bulk:" and this circumstance Tulpus seems to hint, as if he judg'd from the external appearances, in the beginning of a history, which is likewise related in the Sepulchretum (*o*), though not without some typographical error; but when he comes to the dissection he by no means confirms it.

After these, you will see that both of the examples are, without any scruple, related among the number of exostoses, by some authors, just as another from M. Aurelius Severinus (*p*) has also been, since Mery (*q*) quoted it, as similar to the exostoses of the fingers describ'd by him. But M. Aurelius, though he has really describ'd and delineated a hand which was not unlike these of Mery externally, has, however, expressly said, "that the matter which was found under the diseas'd part, when cut into," was not bony at least; but "that it appear'd like the substance of the bulbous root of slow-bread boil'd; and that it was friable moreover, and yielded to the slightest touch:" so that we could pardon, with a better grace, him who recounted among exostoses, a hand which, to external appearance, was not very much unlike one, and which was examin'd by Ruysch (*r*), in the beginning of this century; for although it was not possible to see through the part, and distinguish whether the tuberosities, into which it had grown out, took their origin from the bone itself, yet he found that one of them was compounded of innumerable lesser tumours, as it were, "partly cartilaginous, and partly osseous."

57. But it is not even sufficient to comprehend under one name of exostosis, except in a general way, those tumours which it is certain are real tumours of some bone, as they greatly differ from each other. For there are some, in which there seems to be nothing contrary to the general tenor of nature, besides a swelling or excrescence of the bone; such as Mery (*s*) has said that the common exostoses are, and such as Bidloo (*t*) has suppos'd to be the only ones that deserve the name of exostosis; requiring the bones to be perfectly sound, not only above and below the tumour, but also that they should be properly cover'd with the periosteum, and not show the least traces of any inflammation internally or outwardly, nor yet of acrimony, putrefaction, or corruption, in the least degree: and this opinion has had more than one follower; and among these the disciple of the celebrated Kulmus, in that

(*l*) n. 53.

(*m*) Obs. Med. 1; 4. c. 13.

(*n*) in Schol. ad Obs. Med. Anat. 94. Cert. 1.

(*o*) Sect. hac Obs. 15, §. 3.

(*p*) De recond. Abscess. nat. 1. 4. c. 1.

(*q*) Mem. de l' Acad. R. des Sc. A. 1720.

(*r*) Epist. Anat. 14.

(*s*) Mem. de l' Acad. R. des Sc. A. 1706

(*t*) Exercit. cit. supra ad n. 56.

dissertation (*u*) which was publish'd in the year 1732, while he himself was president, entitled, *De Exostofi Steatomatode Claviculæ*.

Yet many others, both before and after them, call'd tumours of the bones, wherewith a caries was likewise join'd, exostoses. But in both kinds we meet with divisions again. For the tumour of a bone which is not carious, is either made up of a dense and solid substance, such as Bidloo (*x*) has in the greatest part represented, or of a substance "wholly" cellular, or spongy; as Ruysch (*y*) saw in a thigh bone, which is naturally very hard, and which was encreas'd an inch in its thickness; or, finally, as the same author delineated (*z*) in the os tibiæ, of a substance externally very thick, hard, and compact; yet internally cavernous.

But tumours of a carious bone are either the consequence of a caries, the cause of which was external injury, as in the lower jaw of a girl who had fall'n from a high place, and who is describ'd in the History of the Royal Academy of Sciences at Paris (*a*), or, as is more frequently the case, of an internal disorder of the humours; whether this be from a lues venerea, as Stalpart (*b*) observ'd in the os tibiæ, and even as the figure shows in the os femoris; or from some other cause, as Bogdanus (*c*) found in the whole os tibiæ, referring the cause to that disease which the Arabians call'd the *Ventrositas Spinæ*: and, indeed, that the bones do become tumid from this disease, is very well known; and not only in the limbs, but in other parts also; as Severinus has observ'd (*d*), and the celebrated Kaltschmiedius (*e*) has lately confirm'd, by a singular example in the lower jaw.

Yet how much these tumours differ from each other, where we consider either the various magnitude of the cells which they comprehend, or the various matters which are contain'd in these cells, may not only appear from other observations, but particularly from those that we read in the History of the Academy just now quoted (*f*), and in their Memoirs (*g*); as that of Farcy in the upper part of the thigh, that of Mery in the inferior processes of the thigh-bone, and of the same author in the fingers.

However, even when the exostoses contain nothing that is foreign to the nature of bones, and for that reason nothing which is apt to produce caries, pains, and ulcers; the protuberances themselves, nevertheless, especially those that are large and situated in the joints, by greatly distending the tendons that lie thereon, are exceedingly injurious to the motions of the parts in which these tendons terminate: in the two observations, therefore, of Mery, which were last of all referr'd to, they could by no means be mov'd: but it is singular in that which Richius (*h*) sent to Paris, that a sensible motion of flexion remain'd in the leg, when the lower part of the os femoris was greatly enlarg'd.

(*u*) §. 13. & 24.

(*x*) Exerc. cit. Tab. 2. Fig. 3.

(*y*) Thef. Anat. Max. in fine ad litt. H.

(*z*) Thef. Anat. 10. Tab. 2. Fig. 10.

(*a*) A. 1727. Obs. Anat. 6.

(*b*) Cent. Poster. P. 1. Obs. 44. & Tab. 14.

Fig. 1. & 2.

(*c*) Obs. Anat. Chirurg. 12.

(*d*) De recond. Absc. nat. l. 5. c. 16.

(*e*) Progr. de raro Spinæ Vent. casu.

(*f*) A. 1737. Obs. Anat. 1.

(*g*) A. 1706. & 1720.

(*h*) Hist. de l' Acad. R. des Sc. A. 1739. Obs. Anat. 4.

But that which the very great anatomist Eustachius (*i*) has given us in the history of a Roman matron, is much more surprizing. In her case, the inferior processes of the femur "were grown out into such a tumour as to far exceed the size even of the largest human head;" as dissection, at length, in the dead body demonstrated to the other physicians, who did not give credit to the nature of this tumour; yet the woman "mov'd very freely and easily to all sides;" which circumstance being observ'd by Eustachius, and this at the same time, that those processes, or heads, "although they were become so tumid and turgid, retain'd their natural figure nevertheless," had brought him to attain to a true knowledge of the case while the woman was still living.

Mery, therefore, in the case of that large exostosis which I have just now taken notice of, as describ'd by him in the same processes, has, with great propriety, accounted for the impossibility of flexion in the leg, not only from the tendons being vehemently distended, but also from the figure of these processes being so chang'd, that the lower surface of them was, from a convexity, become plane and flat, and even rather excavated.

58. From these you will collect other distinctions of exostoses in their figure, and not only in their situation; which, both formerly and in our times, you find to have been observ'd even in the extremities of oblong bones, although it is said to occur more frequently in the trunk of them, which they call the diaphysis; and that cannot be denied. But this disorder attacks other bones, also, besides those of the limbs: though it is not agreeable to our purpose here to take notice of all the examples of this kind. I have slightly touch'd upon some from the books that are now in my hands, from whence you will easily imagine how many might be added to this section of the Sepulchretum, in which not only recent examples, but even some ancient ones, are wanting.

If you enquire after others, you will find them in several places, but particularly in that dissertation which I refer'd to above (*k*). The author of which, moreover, gives you a peculiar observation of an exostosis of the clavicle; in which bone he confesses he does not remember whether it had been seen before by others, especially of so considerable a size. I saw, four years after the publication of that dissertation, an exostosis protuberating from the left clavicle in like manner, (which had also formerly receiv'd a blow) and that in the form of a very large spheroid, in a young man, by descent an Italian, who had come hither from Vienna, to see if he could find any one here, who, after so many methods having been tried by various persons, and all to no effect, would undertake to cure him.

This tumour might easily have impos'd upon me also, as it had done upon others, by reason of the teguments wherewith it was cover'd. But the bony hardness which lay beneath, and its very firm connection and continuation with the clavicle, caus'd that dissertation to come into my mind; and I pronounc'd that no cure of it could be made without the application of a saw: which, to say nothing of the danger, neither the decay'd strength of his slender

(*i*) De Multitudine, c. 8.

(*k*) N. 57 Vid. ejus c. 2.

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and delicate little body would bear, nor the deprav'd state of his fluids, which was even original in him, would permit: all which suppositions I confirm'd by letters to the chevalier Nicolaus Garellius, deservedly chief of the imperial archiaters, who had in particular advis'd the mother of the patient, from his peculiar partiality to me, that she would suffer nothing to be done but by my advice; and, at the same time, referr'd him to the dissertation I have quoted, which he had never yet seen.

Nothing, therefore, was done; he himself also, as he wrote back to me, approving my advice, and affirming that the tumour, when shown to him in the beginning, and before any congestion of stagnating humours was made, was really bony, and had its origin from the clavicle itself. Of what structure, therefore, this exostosis was, and what it contain'd, I did not see. But I did see in another, which was prominent from the thigh of a man. Yet before I speak of this, I will answer a kind of tacit interrogation of yours. For you will desire to know how it can happen, that the most rigid and hardest laminæ of bones may be so extended as to form exostoses.

59. In the first place, then, call to mind those things which have been quoted above (l) from a certain response of Valsalva, that there are some exostoses, as they seem at first to be, which are, in fact, nothing else but ligaments and tendons, the thickness and hardness of which being increas'd by the stagnant matter, resemble a tumour of the bone whereupon they lie. Exostoses of this kind occur after a blow, a luxation, and other injuries of that kind, externally applied; and one, in particular, occur'd in a noble abbot, a colleague of mine, who, after having his foot luxated, and replac'd, had so considerable a hardness in a certain place, on the upper and back-part of the foot, that the bone might have seem'd to most persons to be prominent beyond its situation; yet, by the use of cerates containing gum ammoniacum, by time, and walking, it was at length entirely taken away.

Nor, probably, were those exostoses of a different kind which Severinus (m) says he himself had been troubl'd with at the lower part of each elbow, and which perpetually incommoded him when he lean'd upon them, till some years after they were discuss'd without any remedy. These, he says, "are wont to be call'd *soppresso*" by farriers, as if "accessions of bony matter made upon the bones:" and it is surprizing that Stalpart (n), in copying this passage from a nameless author, after some other things, which follow soon after in the same Severinus, should understand this Italian word *soppresso* in so wrong a sense, as to say that it signified "an ulceration of the bones."

But to come from false exostoses to the true, and from ligaments and tendons to the periosteum, which adheres very closely to the bones; Boerhaave (o) proposes a double kind of exostosis: the first, wherein the periosteum alone is obstructed, and after that swells by various degrees till it attains to the hardness of bone; the second, where the lamellæ of the bones recede in such a manner from their usual contact, that he saw the bones of the cranium four times thicker than they naturally are, and altogether fungous, so as to resemble a pumice-stone.

(l) N. 13. (m) De recond. Absc. nat. l. 4. c. 9. § 4. (n) Schol. ad Obf. cit. supra, n. 57.
(o) Prælect. ad Instit. § 711.

The former of these modes, then, you may make use of in order to explain those exostoses which, being protuberant on the external surface of the bones, consist of a compact bony substance, as in those examples that I have quoted from Bidloo and Ruysch (*p*); but you will much more readily explain them in this manner, after you have read the explications of the celebrated Duhamel (*q*), which are not only not different, but even confirm'd by his own experiments, while he inspected exostoses of this kind excited by himself in living animals, in their various degrees of induration, and attended to it from whence they proceeded. And, indeed, although he confesses that he could never yet excite exostoses of another kind, that is, spongy exostoses; yet he hints at a mode wherein we may conceive that these, also, are made up of the periosteum; and in fine concludes, that whatever wounds, irritates, inflames, or makes the periosteum tumid; which kind of injuries, it is certain, have very often happen'd before the production of exostoses; may without doubt give origin thereto: and this opinion of that very experienc'd man will have somewhat more weight with you, when you read over the memoirs which he previously wrote, wherein he deduces the production and reparation of the bones from the periosteum.

Yet as there are not wanting some who oppose contradictory experiments, and as he himself, like a prudent and cautious observer, denies that he contends for the opinion of all exostoses proceeding from some disorder of the periosteum; if you suppose those are to be excepted, in which, according to the second mode mention'd by Boerhaave, the laminæ of the bone itself have receded from each other; you will not easily understand by what means they could, when they are very hard and very rigid, be mov'd and forc'd outwardly, be curv'd, expanded, and increase; unless you suppose them to be again made soft, and to have return'd to the former nature of a cartilage, as it were.

Many examples of this change are, certainly, extant in the books of physicians, some of which you will see pointed out by the very learned Haller (*r*); and not to go far from the observations taken notice of above, Tulpus, also (*s*), saw bones "so tender, flaccid, and soft, that they could be cut very easily with a knife, like wax;" and Richius (*t*) found them so soften'd, that he took the exostosis for a certain species of the *spina ventosa scorbutica*. To these add those that have been found, more than once, by the celebrated Heister (*u*), and not in children only, but in men also, so soft as to be very easily cut with the knife, when they were affected with a *spina ventosa*: wherefore, as he supposes that from deprav'd humours of the venereal, scorbutic, variolous, and even ricketty kind (for it is certain that ricketty children are also subject to umours at the extremities of the bones) effus'd by the eroded sanguiferous vessels into the cavities and cells of the bones, and vitiating the medullary oil; as he supposes, I say, that the bony lamellæ are

(*p*) Supra, n. 57.

(*q*) Mem. de l'Acad. R. des Sc. A. 1743.
Mem. 6. sur les Os, Obs. 31. & seqq.

(*r*) Not. b ad Prælect. Boerh. in Instit. § n. 5. & Diff. de Oss. Tumor. n. 28. & seqq.

(*s*) C. cit. supra ad n. 56.

(*t*) Cit. supra ad n. 57.

(*u*) Instit. Chir. P. 1. l. 5. c. 9. not. a ad

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soften'd by humours of this kind, so he thinks that, when soften'd, they are by degrees urg'd outwards, from the congestion and pressure of these fluids, and expanded in their compass.

And I scarcely doubt but you will follow this, or some other similar explanation, in those tumours, in particular, which are as yet comprehended by soft bony lamellæ; though you might rather hesitate in regard to those in which, though these lamellæ were perceiv'd to be every-where rigid and hard, the bulk, nevertheless, still continu'd to be increas'd, and even gain'd a very great increase in the latter years of its existence; suppose, for instance, an increase equal to that of the fingers spoken of by Mery (*x*), and of the clavicle in that dissertation quoted above (*y*): although in these two examples some room is left for the explanation; in the latter, by reason of the cartilaginous parts being here and there interpos'd to the bony in the circumference of the tumour; and in the first, by reason of the same circumference being interrupted with carious ulcers in many parts.

But so far on this subject; for we have even said more than is necessary to show you of what kind, and from what cause, this exostosis was which was seen by me in that person of whom I shall immediately speak, and examin'd by dissection after the death of the patient.

60. The body of a man, of thirty years of age, of whom we could learn nothing more than that he was taken off by an apoplexy, was brought into the college, when I was teaching anatomy there, in the month of January, in the year 1732, and his limbs made use of for the public demonstrations; by which I had an opportunity of examining a protuberance on the left os femoris, of the form of a spheroid, and of the bigness of a middle-siz'd apple. This tumour was prominent at a little distance above the inferior heads, or processes, of that bone, and on the posterior surface.

The bone being cut with the saw in a longitudinal direction, on examination I found it to consist of bony cells, which abounded with a medullary oil, of a liquid consistence, and of a yellow colour; the cavity of the bone, which corresponded to that protuberance, being fill'd with a very large quantity of the same kind of oil. And the yellowness and liquid state of this oil, in both places, became worthy of remark, on account of the marrow in the farther cavity of the bone being somewhat red and concreted; and the occasion of this observation was encreas'd by the great coldness of the season, with which, though other fluids were frozen to ice, a part of that oil, nevertheless, had not in the least become concreted.

61. Whether that change of the medullary oil in an exostosis, and about an exostosis, was the consequence of this tumour, or preceded it, I leave to you to determine. For I think I have said more than enough of bony tumours, at least as far as relates to the present purpose, and I perceive that this letter is already grown out beyond the bounds of my first intentions. And yet I have not touch'd upon all the tumours, even of those which happen chiefly in the lower limbs, tho' I, last of all, insist principally on those; and of this kind, among others, are varices, cedemas, and clavi or corns of the feet.

(*x*) Cit. *supra*. n. 56.

(*y*) Cit. *supra*, n. 57.

But in regard to varices, I had scarcely any thing that was worthy of remark, unless I should perhaps have chosen to refer you to Bidloo (z), to be inform'd of the immense size of some varices; in order to understand which, when already form'd, it is necessary to suppose a laxity of the coats of the veins, or a loss of tone, in consequence of too violent exercises, too long-continu'd exertions in standing, or carrying heavy burdens; and constrictions or compressions that prevent the free motion of the blood, with other things of a similar kind.

And who can allow that a laxity of the valves has no effect, in completing that dilatation which is begun to be form'd? I should even suppose, that to the commonly-known office of the valves, which relates very much to the present case, another might be added, as having the same relation; I mean, that like bands or ligaments they may strengthen the vein, as far as it is possible, by passing from one paries to the other; so as to make it less to be wonder'd at that the dilatation is increas'd, when they are relax'd or lacerated.

And as to œdematous tumours, I have spoken of them sufficiently when writing of the chronic and hydropical affections of the viscera: and indeed it is from the previous histories of these affections, that almost all the examples of œdemas are taken in the Sepulchretum, in order to be repeated here.

Nor should I have any thing to add in regard to clavi, if you had not lately ask'd me my opinion of that incurable clavus, from the irksomeness of which it is said, by the younger Pliny (a), that Silius Italicus, a consular man, and at the same time no contemptible poet, would have put an end to his own life by hunger. "The cause of death," says he, "was his ill health. He was affected with an incurable *clavus*."

If he had said more than these words, you would not, I suppose, have then ask'd me what this clavus was, or where it was. You therefore would have me divine. For you cannot be ignorant, when you read Celsus (b) and Aetius (c), that clavi may arise not only in the feet, but in the eyes also, not to mention other places; and of those which have their origin in the eyes, that the disorder call'd clavus by Aetius, is different from that to which Celsus gives the same name; for the former means the tunica uvea prolaps'd, in a considerable part of it, on the outside of the eye, and already become hard, in the same manner as Paulus (d) and Actuarius (e) understand the terms; but Celsus means callous tubercles in the white of the eye: and he says also that clavi, which exist elsewhere, arise not only from contusions, but sometimes from other causes also.

Yet as you know that all these tumours, whether form'd in the feet or in the eyes, or in any other part, have been call'd clavi from the similarity of their figure; you plainly see how many cases, that are various in their nature, situation, and causes, are comprehended under this term alone, and how easily clavi may be incurable; and not only in proportion to these varieties,

(z) Dec. 1. Exercit. Anat. Chir. 6.

(a) l. 3. Epist. 7.

(b) De Medic. l. 5. c. 28. S. 14. & l. 7. c.

7. S. 12.

(c) Medic. Tetrabibl. 2. S. 3. c. 34.

(d) De Re Med. l. 3. c. 22. ubi de prolaps.

ocul.

(e) Medic. l. 2. c. 27.

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but also in proportion to the severity in the method of curing them (*f*), be sometimes the occasion of great irksomeness and pain, not to say always; particularly in a man such as Silius Italicus, who, as the same author Pliny (*g*) has told us, “had pass’d through his seventy-fifth year, and was of a delicate habit of body.”

But though this is the state of the question, as there is nevertheless so great a latitude in understanding the case, and consequently a great difficulty in ascertaining the truth, I do not think that it is in my power greatly to resist the opinion of any one, who may think differently from me; yet perhaps this will not prevent you from thinking that I come pretty near to probability, if I say that no other clavus was here meant by Pliny, than a clavus of the feet. For those that are form’d in the eyes are more rare; and the others “sometimes indeed have their origin in other parts, but chiefly in “the feet,” as Celsus (*b*), and those Grecians (*i*), and even the fact itself, confirm; so that he who speaks of a clavus, without making mention of its particular situation, and particularly if he is not a physician, seems to signify a clavus of the feet, rather than of any other part: although, indeed, one who is not a physician would certainly scarcely omit that particular mention, or some other adjunct, if he meant, by the term clavus, to point out any other disorder, but that of which this word most generally conveys the idea; of which rare kind, clavi of the eyes, or a certain species of furunculi, are; yet you read in Ingrassias (*k*), “that some us’d to call this species clavus or spina;” and certain clavi of the feet themselves, when explain’d in the manner they are by the author of the *Finitiones Medicæ* (*l*), which are ascrib’d to Galen, are rare also; for in this work we read that, “a clavus is “an orbicular ulcer in the sole of the foot, which has contracted a callus.”

And if this definition had come into the mind of that learned physician Lochner (*m*), when he describ’d a species of a very malignant kind of clavus, as having been seen by him, not without death being the consequence; he would, in my opinion, more readily have made mention of it, than of the disease call’d by the ancients *gemurfa*, inasmuch as it is a disease which, if it were in fact any species of the clavus, has not its seat, however, in the sole of the foot, but, as Festus says (*n*), “arises under the little toe, and even betwixt the toes,” as the elder Pliny had said, who is likewise quoted by Lochner, in the twenty-sixth book indeed, but in the first chapter, when speaking of the *gemurfa*, as of a disorder which was “soon put a stop to in “Italy,” and that long ago, so as for “even the name of it to be obliterated.”

All which things I was willing to take notice of for example’s sake; not that I believe there to have been so many significations of the word clavus among physicians, and still less among others, in the age of the younger Pliny; though there certainly was, among all, that sense in which I, for this reason,

(*f*) Vid. exempla plura apud mox citandum Lochnerum, & in Epistola indicanda.

(*g*) Epist. cit.

(*b*) Sect. 14. cit.

(*i*) Aet. Tetrab. 4. Serm. 2. c. 82. & Paul.

1. 3. cit. c. 80.

(*k*) De Tumor. p. n. ubi de Furuncul.

(*l*) jam propius finem.

(*m*) Eph. N. C. Cent. 1. & 2. Obs. 192.

(*n*) De Verbor. Signific. l. 7.

suppose him to have made use of it also. And from hence, and from the word *natus*, which he has made use of, not so proper to all diseases as to the diseases of this kind, you will, at the same time, understand, why I did not fall into the opinion, as I am wont to do at other times, of another very learned physician, who in a particular letter, publish'd some years ago, upon the clavus of Silius, supposes it to have been that pain of the head; which, however, he, in consequence of his very commendable ingenuousness, confesses he could never find to have been call'd by the name of clavus, before Valescus de Taranta, that is, before the fourteenth century. Farewel.

LETTER the FIFTY-FIRST

Treats of Wounds and Blows of the Head.

1. **T**HERE are, in the papers of Valsalva, so many observations which relate to wounds and blows, that, if I meant to comprize all of them in one letter, I should seem to send you a book instead of a letter. Being, therefore, under a necessity of dividing them according to their various situations, I now send you those that relate to the head, and shall send the others hereafter. And beginning with those wherein the cranium was either not at all hurt, or only slightly, I shall go on to those wherein it was found to be either quite fissur'd, or fractur'd.

2. A young man, of sixteen years of age, was struck with a stone which was thrown, in the left part of the sinciput, near to the lambdoidal suture, at the distance of about two inches from the sagittal. No symptom that was worthy of remark was the consequence; except the lips of the wound beginning to swell, and that some days only before the eleventh day. On which day a fever discover'd itself, with a coldness and a vomiting, but without any pain of the head. After this follow'd convulsive motions, speechlessness, deafness, and blindness; and, finally, in the beginning of the fourteenth day, death itself.

The cranium was unhurt, and yet the dura mater, in that part which lay under the wound, for almost as large a space as the wound was continu'd, was found to be thicken'd, and very lax, of an unequal surface, and of a colour verging to a yellowish hue; and betwixt this membrane and the pia mater, a concocted pus was found to stagnate betwixt the falciform process, and the upper part of the cerebrum which lay near thereto, quite to the anterior parts. In the whole of the cerebrum itself, however, was found no injury which fell under the notice of the senses.

3. A man

3. A man, who was near sixty years of age, receiv'd a blow with a stick, a little above the extreme part of the forehead, and the left temple; no morbid symptom appearing then, or in the following days; so that he came by himself every day to the hospital of St. Mary de Morte, at Bologna; where the usual remedies were applied to his wound, which was suppos'd to be no more than cutaneous, and of no importance.

And, indeed, during four or five of these days, he continu'd in the market selling chesnuts, according to his usual custom, in a very cold season. But about the sixth day his wound became worse, and a fever, attended with a coldness and rigor, came on: and this returning every day in the same manner, without any other symptom being added, than a slight gangrene of the wounded part, the man was gradually carried off thereby.

The carcase was contracted, as it seem'd, from the coldness of the season. A little sanies had descended from the wound betwixt the extreme margin of the temporal muscle and the bone. And the gangrene, by its erosion, had dilated the wound to the size of that piece of money which is called a Roman crown: and there the naked bone came into sight.

On cutting out the upper part of the cranium, no sign of injury could be observ'd in that bone, even upon the most strict examination, Yet the meninges were found to be sanious, and somewhat thicken'd, in the whole of that space wherein the bone had been laid bare. The cerebrum, which lay beneath these thicken'd parts of the meninges, had contracted a very evident, though a very slight injury. For externally, the substance thereof was corrupted to the size of a small vetch; and in the middle it seem'd to be perforated with a very small foramen. But this foramen, together with the corruption, did not descend lower than to a very small depth.

4. Before I here add other histories of the same kind, you will certainly make some enquiries; and this in the first place, how it could be that, though the bone was unhurt, the meninges which lie beneath were nevertheless both purulent and sanious; and how the brain itself was found to be not without some injury in this man? Berengarius, indeed, as you have it even in that second section of the Sepulchretum (*a*), suspected it might happen that the sanies should pass through the pores of the cranium, from the external wound, especially if it had not a free exit from the wound: and that this may happen in some certain places is not to be denied; as, for instance, where the sanguiferous vessels are pierc'd through, or where the sutures are very lax. Yet, for the most part, it is better to suppose, with him, what I shall speak in the words of Celsus (*b*), "that although the bone remain'd entire, some vein, being ruptur'd internally, in the membrane of the cerebrum, from the blow, discharges a little blood:" and that this vein is ruptur'd from a violent concussion of the cranium.

In the same manner you will explain many observations, similar to those I have produc'd; as, in particular, that of Mauchartus (*c*), wherein, till so far as the tenth day, there appear'd no bad sign; and yet how much mischief was conceal'd under the cranium, which was every where unhurt, the

(*a*) 1. 4. in Schol. ad Obs. 1.
(*b*) De Medic. l. 3. c. 4.

(*c*) Eph. N. C. Cent. 9. Obs. 40.

dissection of the patient, who died suddenly before the fourteenth day, sufficiently shew'd. And by what means it may happen that, in a concussion of the skull, the vessels within its cavity shall be ruptur'd, has been shown at large by Peter Simon Rohault (*d*). But if the concussion should have been very small, and within the cranium, which is not at all injur'd, the internal parts be found to have been hurt; see in what manner Bohn (*e*) conjectur'd that this might happen in his observation, and that of others; from whose writings (*f*) you will pick out several that you may add to this section of the Sepulchretum.

But to return to those observations which I have given you from Valsalva; you will ask me, in the next place, why the blood, which was extravasated within the skull, did not begin to give tokens of its effusion immediately, instead of beginning so many days after? Without doubt, because very small drops, distilling from a small vessel slowly and by degrees, could not arrive to such a quantity as to be injurious till after some days had pass'd, and at the same time could not arrive to such a state of corruption as to vitiate the meninges and brain.

Yet both of these circumstances were brought about the sooner in him who, continually exposing himself to the very cold air, gave occasion, by the contraction of the external vessels, for a greater quantity of blood being carried through the internal parts; and that in a leis salubrious state, by reason of insensible perspiration being retain'd. The contrary external cause may also produce the same effects, by exciting and heating the blood; as in the son of Theodorus (who died of a wound in the head, which was to appearance slight) Vallesius (*g*) conjectur'd, and with very good reason, since, after having been expos'd to the sun "on the ninth day, the first fever came upon him "on the tenth."

But if you ask me why, of the two first whose histories I have written, he whom the fever seiz'd the soonest was carried off by no disorder besides this; but he who was seiz'd with a fever later, was carried off by so many other very violent disorders in conjunction with it; many reasons may be given for this difference: first, the delay itself, whereby both the quantity and the depravity of the extravasated matter, although latent in the concocted pus, was, without doubt, increas'd: in the second place, the different disposition of the humours and parts in different bodies and different ages: and, finally, the different kind of violence applied by the throwing of a stone, and by the blow of a stick.

Thus, in the fifth book of the Epidemics (*h*), you see that "he who was struck on the head with a stone by the Macedonian, was entirely depriv'd of his speech, heard nothing at all, and was agitated," that is, "in a convulsive manner," as the same Vallesius (*i*) rightly interprets it; which are almost the same symptoms that were suffer'd by our young man, though later, that is to say, on the eleventh day, and not, like the other, on the third:

(*d*) *Traité des Playes de tête* ch. 4. & 10.

(*e*) *Differt. de Trepanat. difficult.*

(*f*) *Etiam de Renunc. Vulner.*

(*g*) *Comm. in l. 7. Epid. ad 29. & in l. 5.*

ad 97.

(*h*) *N. 24. apud Marinell.*

(*i*) *Comm. ad eam historiam, quæ ipsi est*

n. 56.

neither did this young man, like him, fall down from the blow, nor had he his skull fissur'd, and that "above the right temple;" as the same history; which is repeated somewhat more at large in the seventh book, teaches (*k*); though Vallesius, who had remark'd so many other things, does not observe this, and enquires, therefore, "in what part of the head this man had receiv'd the blow." And from this history you will perceive, that the various force of the striking body, and the part of the head besides which is stricken, ought to be attended to in the distinctions of wounds of this kind. But now let us add other observations.

5. A young man, of about thirty years of age, had two wounds inflicted by cutting instruments; the one on the left part of his forehead, the other opposite thereto, as it were, in the occiput. He had a vain irritation to vomit. He died about the twenty-fifth day.

In dissecting the head, nothing was found, either internally or externally, that was worthy of remark, as far as related to the wound of the occiput. But that of the forehead first show'd a sanies about it, betwixt the skin and the cranium, which in that part had eroded the pericranium and the internal surface of the skin itself, like a *herpes exedens*, and had in some measure separated the anterior, and at the same time superior, part of the temporal muscle. But internally, although the os frontis show'd no more marks of injury than the os occipitis did, yet betwixt the bone and the dura mater there was a sanies to the quantity of two drachms, which had eroded that membrane. And, indeed, on the right side, under the upper part of the cranium, in the interstices of the blood-vessels of the same membrane, was found a matter similar to sanies, but thicker. The other parts within the cranium were in a natural state.

6. An old man, of sixty years of age, who was very subject to epilepsies, being seiz'd with a paroxysm, and falling upon the ground, receiv'd a blow upon the left part of the thorax, and, at the same time, on the left side of the head, above the temporal muscle. That part of the thorax was in much pain: his respiration was difficult, and, in the beginning, blood was thrown out at the mouth by the strainings to vomit. His head was weak, dull, and heavy; so that when ask'd a question, he scarcely gave any answer.

His thorax being open'd after death, the left cavity of it was found; but in the right cavity was found serum, to about the quantity of a pint; and the lungs on this side adher'd to the pleura in their upper part, and were universally indurated, as they generally are in a peripneumony. The ventricles of the heart contain'd polypous concretions; that in the right being very large.

In the head, the left temporal muscle was a little bruise'd: and when the head was open'd, a portion of coagulated blood was found betwixt the left os petrosum and the dura mater; which bone adher'd so closely to the dura mater, that it could not be separated but by force. However, the pia mater show'd a little gelatinous concretion of serum at the sides of the vessels; and the ventricles contain'd a little extravasated serum: the remaining part of the cerebrum was found.

7. A man, of forty years of age, falling from a high place, hurt his left eye: and the skin above the eye-brow was, probably, torn by a stone. In the beginning he was seiz'd with a fever; which rendered afterwards. But about the twelfth day, after the commission of an error in the prescrib'd method of living, a more violent fever came on: to which, about the fourteenth day, a convulsion of the whole left side of the face was added, together with a cruel pain in the very ball of the eye. And at length the patient died about the twentieth day.

When the head was examin'd, these appearances were found. Under the skin that was lacerated above the eye-brow, was that nerve which, coming forth from the orbit, is reflected upwards on the forehead; so that being either contus'd, or in any other manner injur'd, it might easily excite convulsion. And the ball of the eye being somewhat putrid on the external part, had brought on a slight erosion in the bone which is interpos'd betwixt the orbit and the brain, yet not to such a degree as to affect the brain, which was found in this place. Towards the left part of the occiput, however, a small portion of the brain inclin'd from its native colour to that of a brownish colour. And the dura mater, which corresponded with this portion, was somewhat moist externally with a sanies.

8. Although, in falling from high places, it frequently happens, that besides the part which is manifestly contus'd, some other is also contus'd less-evidently, and it is, for this reason, less surprizing, that upon dashing the os frontis against a hard body, some injury and a sanies should be found internally at the occiput; yet in the young man also (*l*), who was wounded on the left side, as a matter similar to sanies was found on the right side; and as, in the old man (*m*), not that part of the thorax which was struck against the ground, but the opposite, show'd an internal disorder; I shall add something upon these subjects below (*n*), as I also shall of convulsions, in consequence of injuries of the nerve which is reflected under the eye-brow.

Yet I do not attribute the convulsions and death of this man to that nerve only, but also to the sanies, wherewith the dura mater was moist; as I do the disease and death of the old man, partly to the peripneumonic state of the lungs, and partly to the blood which was coagulated betwixt the basis of the cranium and that membrane, and which adher'd thereto, no less than it adher'd in that man who, being kill'd within the space of four days, by a fall from a considerable height, is spoken of in the commentaries of the Imperial Academy of Sciences at Petersburg (*o*).

However, the marks of injury which were found within the cranium in these three observations, without the cranium itself being injur'd, may be explain'd, you perceive, in the same manner, that the former two, which you have read before them, were explain'd (*p*). Nor will you suppose, I believe, that the five which I shall immediately subjoin, ought to be differently explain'd; the cranium in them, indeed, being injur'd externally, but internally quite sound.

9. An old man, about seventy years of age, falling from a considerable

(*l*) n. 5. (*m*) n. 6.
(*n*) n. 41. & n. 16.

(*o*) Tom. 7.
(*p*) n. 4.

height upon the ground, receiv'd a blow on the posterior and right side of the sinciput. After his fall he lay half-stupid: and although his stupor was discuss'd soon after, and he walk'd by himself into the hospital, he nevertheless denied that he knew any thing of his fall, or had any remembrance of the affair. The wound was attended with no symptoms during the first days.

Yet scarcely was the seventh day pass'd over, but it was seiz'd with a gangrene: and to the gangrene a fever was join'd. However, the gangrene being remov'd in the space of a few days, the fever was remov'd likewise. After this the patient complain'd of a pain that oppress'd the posterior part of the head, which, however, was not violent. But about the twentieth day he was seiz'd with a fever, a rigor, and a vomiting. And this fever returning afterwards, without the vomiting, sometimes twice, and sometimes thrée times, every day, all the vital actions gradually decay'd, and the patient was carried off about the thirtieth day.

The os sincipitis, on the right side, near to the sagittal and lambdoidal sutures, had its exterior lamina somewhat injur'd and broken; but internally it was perfectly sound. Betwixt the two meninges, and in the ventricles of the brain, was serum; the whole of which weigh'd nearly four ounces. The cerebrum was soft and flaccid; and was contain'd in a pretty lax space within the cranium.

10. In this patient, four of those circumstances seem'd to be united, which, when join'd together, may justly give us reason to believe that there has been a very considerable concussion of the brain: the fall from a high place, the stupor immediately following the fall, together with the total forgetfulness of the fall itself, the cranium not being broken, and the interval betwixt this and the brain being increas'd.

Ludovicus Duretus (*q*), upon that passage of the *Coacæ Prænotiones*: "They who have a concussion of the brain, and have felt pain therein after being struck, or having fall'n, are immediately bereft of their speech, do not see nor hear, and for the most part die," sufficiently shows how much more liable to concussion the brain is, "if it happen to have lost that fulness or plumpness that took up the whole cavity of the cranium." And as Fallopius (*r*) (in the same manner as Fernelius (*s*) in the full moons) acknowledges this fullness, "when the moon shines through the whole night;" so he affirm'd it to be true, that, "when there is no full moon, the skull is not quite fill'd up by the brain, but there is some space, and that the vessels, by which the parts are connected, are a little distracted;" and that he himself "had observ'd it in dissections."

But whether this has (by the anatomists after him, as Piccolhominus, whom I before spoke to you of (*t*), when I happen'd to be upon the same subject) not only been affirm'd in words, but confirm'd by accurate observations also, I do not call to mind; although this confirmation might very well agree with the opinion of those who did not doubt but, according to the various phases of the moon, the force of diseases was various, particularly of diseases affecting the head, and that the danger from wounds of this kind is different.

(*q*) Interpret. l. 5. tr. 2. c. 2.
(*r*) Traët. de Vulnér. c. 12.

(*s*) Pathol. l. 7. c. 8.
(*t*) Epiët. 4. n. 32.

Yet I remember to have read in some authors, and particularly in Salzmann (u), that in several subjects, especially in the cerebellum and the cranium, "a space, almost equal to the cranium, is sometimes seen;" and even it has not been supposed that the cranium has been equally fill'd with the brain, as first said by the Adversaria (x): although whether it is empty, or full, in the phases of the moon, is neither said by them, nor has the truth, been attended to by me.

It does not, indeed, escape me, as Glisson (y), that in the living animals there are only potential and not actual vacuities in the viscera of the belly; "and that all the parts thereof are full of the force of the equable compression of the atmosphere;" and on the present day, that no interval is acknowledged by any of the excellent men, betwixt any of the parts of a living body, as the cranium is unchangeable in its figure, and the brain is never less turgid, either from the phases of the moon, as is asserted by the learned Mead (z), or from any cause whatever, which may expand the blood; I do not well see how we can deny that the cranium is sometimes be more or less distant from the skull, even in the living. And to this may be added, the contraction and density of the brain, from what cause soever it may arise, (for the ancients, and particularly Bauhin (a), suppos'd it to happen from old age itself, and from the diminution of the bulk of the brain, and consequently make it press against the closing cranium.

At least Littre (b) not only found the substance of the brain in the state I have mention'd, but also found it at a considerable distance from the cranium, in a robust youth, who had run, in the most violent manner imaginable, with his head against the wall, so as to kill himself in the first moment of time. And although he considers this state of the brain, as the effect of the concussion; there will be some, perhaps, who will consider it as the cause of the concussion; and still a greater number, who will consider the concussion being more violent; and giving way, and the dashing of it against the cranium, and being body, as the causes of this concussion being so violent.

For you know much is attributed to both these causes of concussion by the more modern surgeons; to the second for this reason, that "the brain being shaken against a hard body, and driven back again, the whole being motions, diametrically opposite, in one moment of time, follows two because "if the cranium is not broken, the whole impetus of the percussion "is directed to the brain," in consequence of its being "intercepted" by no large fracture, or by "a bone which is broken into many pieces."

Why then, you will say, since in the old man you have just now described from Valsalva, these two causes were not wanting, that he had desired to

(u) Differt. de mira cranii Fract. §. 17.

(x) VI. Animad. 84.

(y) Tract. de Partib. Continent. c. 16.

(z) De imperio, at last.

(a) Schol. ad Hist. Natur. in Hist. Nat. p. 100.

(b) Hist. Nat. p. 100.

Obf. Anat. 12.

head against the ground, and had not his cranium fractur'd) and though there seem'd to be so many other circumstances from whence a great concussion of the brain might be conjectur'd, did he not die before the thirtieth day, nor suffer so considerable disorders, nor yet show any blood, or pus, to have been extravasated within the cranium? I suppose because he, probably, did not fall from a very high place, though from a place of some height; nor yet upon stones; and because part of the violence of the blow was intercepted by the external lamina of the cranium giving way, and being broken in pieces. And the slight and short stupor, and the loss of memory, which then happen'd, as they happen'd without the other disorders that are enumerated by Hippocrates, show'd the concussion of the brain to have been less.

For our Peter de Marchettis, as you have it there (c) in the Sepulchretum also, saw "some persons who had only this symptom appear after a fall, or a blow upon the head, (that is to say, an alienation of mind, with a privation of sense and motion;" which are certainly more violent symptoms than those that immediately follow'd the fall of our old man) saw those persons, I say, "quite free from disease on the following day."

Since, therefore, this concussion was more slight, and so much the more slight, if the brain happen'd to be at that time soft and flaccid, or approaching nearly to this state, it is not to be wonder'd at that the larger blood-vessels were none of them ruptur'd; but only such very small ones as would naturally discharge, by a very slow distillation, those four ounces of serum, which, by gradually injuring the vital actions, at length totally destroy'd the man.

But if you should choose rather to suppose that fluid to have proceeded gradually from the small vessels, not of the blood, but of the lymph, which were ruptur'd, supposing that, by this means, both the rupture of these vessels, and the long stagnation of that extravasated matter, without any evident corruption, may be better conceiv'd of; you will have some authors, in conjunction with whom you will think, and among these Rohault (d), and before him Bohn, who has even produc'd the dissections from whence he made this conjecture (e); and has affirm'd, in a succeeding work (f), what he at first had left undetermin'd, that he had seen the lympheducts "about the convolutions of the brain, in particular, very turgid" in a certain boy.

However, that some vessel is broken in the concussion of the brain, appears from very frequent observations; to which you may add that publish'd by Christian Vater (g): yet that this is perpetual in a fatal concussion, as if the extravasated humours always were the causes of death, and the concussion of the brain never was of itself fatal, it does not seem possible for those to assert, to whom the history I have quoted from Littre, and another, in like manner, of the celebrated Hævelius (h), are known. For in neither of these was any thing found to be extravasated after the most violent blow upon the head.

(c) Schol. ad Obs. 12.

(d) Tr. cit. supra ad n. 4. c. 11.

(e) De Renunc. Veln. Sect. 2. c. 1.

(f) De Trepan. diffic.

(g) Eph. N. C. Dec. 3. A. 9. & 10. Obs. 165.

(h) Commenc. Litter. A. 1741. Hebd. 14. in fin.

Nor will any one have the better side of the question, in asserting that an extravasation was not made for this reason, that immediately after the concussion the motion of the fluids ceas'd, together with life. For besides that it appears, from the second history, that the man had liv'd about twelve hours after the blow was receiv'd; it is certain that neither of them was kill'd by an extravasation where there was none at all. Death, therefore, was brought on by the concussion alone. Wherefore there is even room to doubt often, when an extravasation is join'd with it, whether the one, or the other, of the two, had the greater efficacy in producing the catastrophe.

But in order to conceive in what manner the particles of the cranium are shaken, at the time of a violent percussion, and when shaken give a still greater concussion to the brain than they suffer themselves, and how the concussion of the brain renders it unfit for its necessary functions, by injuring its proper, not more invifible than tender, internal structure, by stretching the fibres thereof, by relaxing, by distorting, by compressing, by entangling, by lacerating, or by vitiating them, in any other way whatever; I say, in order to conceive how these changes happen, you may read the conjectures of Bohn (*i*). After having read which, you will, perhaps, think it quite superfluous to enquire, whether any injury of the same kind be brought upon the small trunks of the nerves also, where they already go out from the medulla oblongata, by the great concussion of the brain; and whether, if it be brought on, this injury, of itself alone, is capable of bringing on all those violent disorders which then follow.

But now, laying aside these disquisitions, let us go on to propose more violent effects of wounds in the head, than appear'd in the old man describ'd; whether we consider them as following in the living body, or found in the body after death.

11. A woman, of more than forty years of age, falling from a high ladder, hurt the left part of her scaput, a little above the os temporis. She lay as in a manner dead after her fall: yet a little after this she seem'd to be in health as before; nor did there appear to be any wound, except of the skin. And although, about the fourteenth day, the skin was seiz'd with a gangrene in the wounded part, which gangrene a fever accompanied, yet within a few days the gangrene was first overcome, and after that the fever. But before the thirtieth day, the fever came on again with a coldness: and to this was added, about the thirty fourth day, an apoplectic affection, with a loss of speech, and a privation of motion in the whole right side of the body, though the sense remain'd at the same time. However, she show'd by nods and signs that she understood what was said: and a kind of epileptic convulsions, as it were, which sometimes affected the whole body, agitated that part no less than they did the left side. At length she died about the fortieth day.

The external lamina of the cranium was open'd into the form of a semicircle, in the part where the head had been injur'd; but the interiors of the bone were sound. Yet the part of the pia mater which lay under that place

was sanious; and the brain, in the same place, was ting'd of a brownish and pall'd colour. But the ventricles thereof were found, as the whole right side was also.

12. A virgin of five and twenty years of age, having fall'n upon the ground, was wounded with a very sharp stone in the left part of her forehead. Being receiv'd into the hospital, she was troubl'd with a continual fever, which increas'd every day. The wound began to be seiz'd with a gangrene, which in that season, (for it was the month of June, 1689) came upon all wounds. Some time after, the patient became idiotic, as it were; she heard but little; she spoke not at all; she fix'd her eyes stedfastly on those about her. At length, a tremor of the whole body came on, during which she died; and this was about the beginning of the twenty-eighth day.

The bone that lay beneath the wound was hollow'd out with a small dent, and a foramen, as it were, externally; about which were seen three chinks. But neither these chinks, nor the foramen, reach'd to the internal parts. Yet the meninges, in that part which answer'd to the wound, were both of them eroded; and from hence a serous colluvies was discharg'd, which, being diffus'd through the whole substance of the brain, had infected it with a disagreeable odour, and ting'd it of a blackish colour.

13. If it had happen'd to be the same season wherein a gangrene came on in the wound of the head of the woman, and of the old man last spoken of, and of the man of whom we spoke almost in the beginning (*k*), that it was in the case of this virgin; we might, perhaps, refer hither a passage from the fourth book of the Epidemics (*l*): "In Aenum, whosoever was wounded in the head, the wound had a horrid aspect, was malignant and suppurated:" and, certainly, that observation of Pigræus, which you have there in the Sepulchretum (*m*), and which mentions a certain year "wherein a gangrene came upon almost all wounds," may be suppos'd to relate to the present case. At least, some preceding deprav'd state of aliments, or present constitutions of air, although sometimes hid from the senses, add, in general, a deprav'd state of some other particular disorder to diseases happening at that time; as has often been observ'd by physicians; and particularly a gangrene, in general, to all wounds, as happen'd some years ago at Paris (*n*), and even in the very city which we are at present speaking of, I mean that of Bologna (*o*).

14. A young man, of eighteen years of age, slender, and of a blackish colour, having receiv'd a blow by a stone that was thrown against one of the ossa sincipitis, where the temporal muscle arises from it, pass'd two days without any symptom worthy of remark, if you except a fever. But on the sixth day after that, as he lay in the hospital of St. Mary de Vita, the wound became livid, and the discharge which came from it was exceedingly foetid; besides which he had an acute fever. To these symptoms was added, near the eighth day, a soporific disorder; so that when spoken to, he made no

(*k*) N. 3.

(*l*) N. 26. Apud Marinell.

(*m*) In Schol. ad § 6. Obs. 6.

(*n*) Malovin Mem. de l'Acad. R. des Sc.

A. 1748, & 1741.

(*o*) Vid. *Commerc. Litter. A.* 1738. Hebd. 42. n. 1. sed & aliis postea annis idem accidit ibidem.

answer. Sometimes he sent forth a kind of suspicious voice. His whole face became tumid and yellow. With all these symptoms he went on to the eleventh day; on which, with a very great expiration, he died.

The whole body seem'd to be that of an icteric person. From the wound a purulent matter had made itself many passages betwixt the cranium and the cutis; which it had also eroded. And the bone had contracted some roughness on the surface, from the stroke of the stone; but show'd no injury on the internal surface, which fell under the notice of the senses. However, betwixt the bone and the dura mater, in the interstices of the vessels of this membrane, was observ'd a cineritious matter, not much unlike a condens'd pus, in that part only which lay under the blow: and in the same part only the cerebrum had contracted a livid colour, to the depth of two inches.

All the other parts within the cranium were found. All the parts in the thorax were found also. But the blood was extremely fluid, except that, in the right ventricle of the heart, was the beginning of a polypous concretion.

15. Another young man, of the same age, of a sanguineous temperament, and of a fatish habit of body, was wounded, on the first of November, in the year 1688, in the upper part of his forehead to the left side; on which he immediately fell down, being somewhat confus'd in his head. Being brought from the place of his fall into the hospital of St. Mary de Morte, he seem'd to hope that he might have a successful cure, as he perform'd all the natural functions of life, and was without any fever. But behold, on the eleventh day, he was attack'd with a fever; which becoming more violent on the day following, gave occasion to open a vein once more. The wound, instead of concocted pus, discharg'd a serous and bloody humour: the part of the forehead which lay under the wound became swell'n: and pains of the head, limbs, and back, were added; which, about the end of the fifteenth day, degenerated into spasmodic affections. And at the same time, as he began to be delirious to such a degree, on the beginning of that day, as to make it necessary to confine him down in bed, he ceas'd to live any more.

The common integuments about the wound being cut asunder, a great quantity of sanious matter was found to lie therein, and extend itself quite to the eye, where the forehead was swell'd. But the bone had been injur'd by the wounding instrument, only superficially. These were the appearances externally. And within the cranium, betwixt the dura and pia mater, in the part where they corresponded to the wound, a quantity of sanious matter was found; notwithstanding, we could discover no mark of injury in those membranes, and none in the whole brain; except that the sanguiferous vessels, which lay hid under the pus, were turgid with very black and coagulated blood, so as almost to resemble varices. The viscera of the thorax, which are sometimes found to be affected in disorders of this kind, were unhurt: and only a polypous concretion was found in the right ventricle of the heart.

16. From what is said in the latter part of this history, you see why it was remark'd, in the latter end of the preceding history, that every thing in the thorax was found. But what marks of injury Valsalva has sometimes seen in the thorax of those who have died of wounds in the head, the four next observations will shew. The first will, at the same time, confirm some of those

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those things which I have already said (*p*) in regard to the injuries of the nerve which is reflected under the eye-brow. For, according to the different force and state of these injuries, sometimes slight convulsions, which spread no farther than the eye, arise; but sometimes very violent and far-diffus'd ones. To these slight convulsions relates, perhaps, in some measure, that passage of the *Coacæ Prænotiones* (*q*) which I have mention'd in a former work: "The sight is obscur'd in wounds made upon the eye-brow, and "a little higher:" and to the very violent ones, in my opinion, the words of Lancisi, which I have likewise quoted heretofore (*r*), refer, "that wounds "which happen in these parts are very dangerous:" and to the same, I should believe, related, in some measure at least, the convulsion of the face in the man whose wound was describ'd above (*s*) at the eye-brow; as well as those much more widely-diffus'd and very violent convulsions, which immediately follow'd the wound that was inflicted on the part I shall speak of immediately.

17. A young man, of six-and-twenty years of age, had a stone thrown at him by an enemy, and was wounded on the right side of the left eye-brow. He fell down immediately, indeed; but soon rose up again, and pursu'd his enemy with alacrity. He afterwards came to the hospital of St. Mary de Vita with the same vigour of mind: where, after the proper remedies were applied to the wound, it was necessary, in a manner, to compel him to remain; so light did he set by a wound of this kind. On that very day, the paroxysm of a quartan intermittent fever, wherewith he was then troubl'd, happen'd to be expected, and really came; but it became a continual fever, with a large and vehement pulse, and a considerable pain of the head.

About the seventh day a delirium was added to the fever, together with some convulsive motions. Near the eleventh, one or two febrile accessions came on, with a peculiar rigor. At length, the delirium ceas'd, and the man lay in a soporose state, except that he was shaken by convulsive motions. And, indeed, those who were about him said, that they had, many times in the night, observ'd him to have rais'd himself up from the bed by an almost incredible exertion, lifting up his head, and clinching both his hands: at the ceasing of which motions he lay like a person dead. Yet his right hand was for two days before his death paralytic, as far as related to the motion; for as to the sensation, it was not quite destitute of that; but after eight hours, the right foot began to be mov'd more weakly likewise. And his respiration having already become laborious before this time, he at length died in the conclusion of the fourteenth day.

By examining the wound externally, a little abscess was observ'd at the side of it; and part of the sanies of this abscess had crept, betwixt the muscles and the skin, towards the ear. But the bone beneath the wound was fissur'd, and the dura mater that answer'd to it was slightly injur'd: the interior part of the cranium on the same side, that is, on the left, was fill'd with pus, which was shut up betwixt the dura and pia mater. And this pus the substance of the brain that lay beneath, seem'd to have imbib'd; for it

(*p*) Epist. Anat. 18. n. 7.
(*q*) N. 3. apud Marinell.

(*r*) Epist. Anat. 18. n. 7. in fin.
(*s*) N. 7.

was of the same colour; but on the surface only. - Every thing else was found; except that a little serum was found at the basis of the cerebrum.

The thorax being open'd, in the lungs were found, here and there, various tubercles, of a considerable hardness: some of which, when cut into, discharg'd a pure sanies; the others, being not yet suppurated, resembl'd the firmness of a glandular body.

18. A boy, about thirteen years of age, was wounded by the throwing of a stone in the right part of the sinciput, above the temporal muscle. He immediately fell down, with some obscuration of the internal senses, and vomited. He was carried into the same hospital, but was not seiz'd with any fever till the fourteenth day. This coming on, a great quantity of sanies was discharg'd by the wound; and a little purulent matter from the mouth by spitting. About the twentieth day a delirium came on; and about the twenty-fifth he died.

In separating the skin from the cranium, about that and the pericranium small abscesses were observ'd: but these had no communication with the wound, which fell under the notice of the senses. Under the wound, however, the bone was broken and depress'd, and adher'd closely to the dura mater, in which it also had fix'd some of its acuminate particles. Yet no laceration of this membrane discover'd itself to the senses; nor yet any injury of the brain, if you except one or two ounces of serum, which ran out by the infundibulum, while the brain was taken out. The thorax being open'd, the lungs were found to be very red, and in them were found small abscesses full of pus.

19. A young man, being struck by a stone on the left side of the sinciput fell down in consequence thereof: yet he came by himself into the hospital of St. Mary de Morte. There were no symptoms of disease. About twenty days after, when the patient had indulg'd himself in eating, a dreadful fever came on; which, by returning many times, afflicted the patient very much. And although he was freed from this fever, yet a cicatrix could never be brought on the bone, which was laid bare in the wound, as long as he liv'd. After these fevers, the patient was attack'd with a cough; which, for a long time, was dry, till two or three days before death he threw up a purulent matter by spitting. In the mean while, a gangrene had seiz'd upon the buttocks by long lying: and besides, on that night which preceded his death, a large abscess was observ'd in the back; and this, being spontaneously ruptur'd, discharg'd a great quantity of pus. Wherefore, no sooner had he pass'd over the second month but he died, without any injury of the intellectual powers.

The body, from a long disease of this kind, and from delay, because we were not permitted to dissect it till some days after death, was very putrid and offensive; yet was dissected with accuracy. The integuments of the head being remov'd, at the upper side of the wound was seen a disjunction of the sagittal future: but the os sincipitis, in that part of it which had been always uncover'd, was without any injury; yet in other parts it was here and there eroded with a caries, but especially near the squamose future, where the caries had perforated the whole thickness thereof. The dura mater, however, which lay under that bone was unaffected, except that it inclin'd to a somewhat

what livid colour, and shew'd several bony particles adhering to it; and on the internal surface, under the very place of the wound, it had an abscess annex'd to it, lying in the excavated substance of the brain, which was small however, so as scarcely to be able to contain a little filbert; and from this, while that membrane was pull'd away from the brain, a thick and green pus was discharg'd. In the dissection of the brain a serum, but in small quantity, was observ'd in the basis of the cranium.

The thorax being open'd, the lungs were found to be hollow'd out with many and various small abscesses; some of which, inclining from the nature of a tubercle to the condition of an abscess, contain'd a sanies not as yet perfect, but such as had only begun to be maturated into a fluid and sanious matter. The pericardium contain'd a great quantity of water; the heart no polypous concretion.

At length we thought proper to enquire whether any passage lay open to the cavity of that large abscess in the back, through the interstices of the muscles, whereby matter might have flow'd thither from the head. However, no appearance of this kind was met with; as the parts which lay between, and especially the external ones, were sound. But the muscles in this body were here and there pale, and those that are call'd abdominal were livid.

20. A man, of fifty years of age, was struck with a stick on the left part of the scaput, no morbid symptom being the consequence of the wound. He came by himself to the hospital; where, by experienc'd surgeons, there was judg'd to be no injury, but an external one; and the cure succeeded happily till the fourteenth day, without the appearance of one bad symptom. But on that very day a fever attack'd him, with a rigor and a pain in the belly. On the following days, in like manner, a difficulty of respiration came on, with a sense of weight, a cough, and a purulent spitting. And at length he died, about the twenty-second day.

As nothing morbid, besides that injury which appear'd externally, could be found in the head; that is, neither in the cranium nor the brain, except that a little serum flow'd out during the dissection of the latter; the thorax was open'd. Both of the cavities of which were full of pus; and the lungs, although loose from the ribs, were found to be distinguish'd with many tubercles, some of which, being already suppurated, emitted a sanies upon incision.

In the pericardium was but a small quantity of water. In both the ventricles of the heart were polypous concretions, that in the right being very large, that in the left but small. The belly at length being open'd, in the right part of the liver frequent tubercles were seen; and amongst these, some which had already come to suppuration.

21. You see that Valsalva is induc'd, by his own observations, to say (1), that the viscera of the thorax are sometimes affected in wounds of the head: although he might have been induc'd even by others. For Nicolaus Massa (2) had already seen, in the year 1553, Victor Trincavella, with other very learned men, being present, such things as I do not remember to be extant, and not only here in the Sepulchretum, but even not in any authors who have treated

(1) Supra, n. 15. in. fin.

(2) lib. Introd. Anat. c. 28.

of subjects of this kind; for which reason I will mention them to you here in a brief manner.

A certain man having receiv'd a wound upon the right side of his head, near to the sagittal suture, together with a wound of the meninges, he died delirious and paralytic; which paralysis, for the most part, says he, is wont to happen on that side of the body which is opposite to the wound. In the head were found two imposthumes, the pus of which was laudable; one in the substance of the brain, near to the wound; the other in the posterior part of the cerebellum. And in the thorax was a great quantity of sanies, and that of an ill-condition'd kind, found within an ulcer of the left lobe of the lungs, the cavity of which was larger than half the shell of a hen's egg. There was also a manifest sanies on the external surface of the left auricle of the heart, the whole of which was ulcerated. But even in the right ventricle of the heart, and in the carnea columna, was a remarkable imposthume, which ascended quite up to one of the valves; this valve also being affected with a considerable tumour of the *apostematous* kind.

And that you may not suppose these apostems to have existed in the thorax, before the wound; Massa asserts, that he knew the man, and that he had not ever complain'd of any pain, nor was troubl'd with any cough, even after he lay ill of the wound, &c.

To this ought to be added the observations of our Marchetti (*). And as these are much more known, and even related in the Sepulchretum (y), you may there see how often he found the lungs and the pleura eroded in wounds of the head, and half the cavity of the thorax fill'd with pus; and how he argues against those who do not deduce this from the wound of the head. For he himself did not doubt, by reason of previous pains in the neck, especially in the hinder and lateral part, but a purulent matter descended from the wound into the cavity of the thorax. Yet this passage, as you have seen by the observation of Valsalva on the young man (z), could not be confirm'd, even in regard to the abscess of the back.

22. You have others then, besides Valsalva, who, in cases of wounds in the head, have sometimes found pus within the thorax. There are even some who have found pus in the belly, as the same Marchetti (a), who has even found a taint of the spleen and purulent pustules; as there are others, which I see transferr'd into the Sepulchretum (b), who say, that abscesses have been translated into the stomach also, the intestines, and mesentery. Yet not only the same observers, and Marchetti and Bohn (c), who likewise mentions the pleura, the lungs, and the spleen promiscuously, do not omit the liver; but most others mention this, as the only viscus into which pus can be carried from the head when wounded.

And that you will learn from all the histories and scholia which are propos'd under the sixteenth observation in the Sepulchretum. Nor will you be puzzled by the carelessness of the printers (d), who write *apostema in capite*, or

(*) Obs. Med. Chir. 15.

(y) Schol. ad § 2. Obs. 16.

(z) supra, n. 19.

(c) Schol. cit.

(b) Obs. 5. § 4.

(c) De Renunc. Vuln. S. 1.

(d) § 1. & 3.

vulneribus hepatis, instead of *apostema in hepate*, and *vulneribus capitis*. But it would, perhaps, rather hurt your understanding to believe, that Ballonius had propos'd, as a thing well-ascertain'd to himself, what he has said of an abscess observ'd in the concave part of the liver; since, upon inspecting that appendix to his little book on convulsions, from whence this passage is taken, you do not find what we have in the *Sepulchretum* (e); "And this I know" to have been observ'd by most surgeons;" but the following words: "Whether this does really happen I am ignorant; yet I have heard that it has been observ'd by the greater part of surgeons. But if it does happen, by what means it can come to pass, and whether it is probable that it can happen, will moreover be worthy of enquiry."

You will be cautious then of placing Ballonius among the observers of this abscess, who ought, in fact, to be plac'd among the explainers of it; as, on the other hand, a certain person ought not to have number'd among the explainers, those who were only witnesses of the observation; but among the observers. And you will be still more cautious, if you happen to be desirous of explaining the affair, of supposing any thing that does not agree with the observations, as if, in most of them, or almost always, or always, as Barbette (f) does not scruple to suppose, pus were translated from the head into "the liver alone." For you have read by whom it has been seen translated even into the heart, the lungs, and the spleen: and, in regard to this last-mention'd viscus, I wonder it should be asserted by him, I do not mean in these cases, but in general, "that it is very rarely found in a preternatural state, in the dissections of bodies."

But we are often compell'd to these things, by a greater solicitude in explaining, than in observing, certain circumstances. For which reason, among those who have written of these things afterwards, the celebrated Molinelli is the more to be commended (g), because he has very properly judg'd that the matter ought first to be accurately observ'd by him, rather than explain'd: and he saw pus sometimes translated into other parts, but not into the liver; and in many not translated into the liver, nor into the other parts; yet in others into the liver certainly, but just in the same manner from other wounded and ulcerated parts, as from the head. And to convince you that it is not so frequently carried into the liver, take this remark with you, that it never happen'd to me; as far as I can remember, to see it: to Valsalva, in such a number of dissections, not more than once; and that when it was, at the same time, translated into the lungs also, and into the cavities of the thorax itself, in great quantity.

Yet it may happen that he did not see it sometimes, because he did not enquire after it; and particularly in that young man (h) whose face became yellow before death, and whose whole body seem'd to be icterical after death; for you have, in the *Sepulchretum* (i), an example of a jaundice with hardness and pain in the region of the liver, and with the putrefaction of this viscus, in consequence of a wound in the head. But by reason of that yel-

(e) § 4.

(f) Schol. ad § 6.

(h) supra, n. 14.

(g) Comment. de Bonon. Sc. Inst. T. 2. P.

(i) Obs. 16. § 5.

lowness which Valsalva observ'd, it is not easy to believe that he did not enquire in what state the liver was: and although, in those especially in whom there are these and other marks of the liver being injur'd, and the wound of the head becomes dry, or suddenly and unexpectedly discharges less pus, it may be suspected by many confirming observations, which I have read, that the pus is translated into the liver; yet the case is not to be predicted for a certainty: for there may be sometimes a fallacy in the symptoms, whether many, or even all of them, occur.

23. If you read the observation of Molinelli (*k*) on a man in whom, as soon as the sanies had ceas'd to flow from the wound of the head, the abdomen began to swell, and be tense; and yet there was no disorder in the liver, but a kind of small ulcers deform'd the surface of the intestines, with a great quantity of sanies, and a great number of tubercles lying at a distance from each other, here and there; you will easily conceive, that if these disorders had belet the part of the intestine colon in particular, which lies immediately under, and contiguous to, the liver, it must have happen'd that many signs of pus being translated into the liver, though fallacious, would have been join'd together. And indeed it may sometimes happen, that all of them come together, and, nevertheless, that he may be deceiv'd, who shall predict that pus will be found in the liver. Read over again the observations of Valsalva which I last of all describ'd to you. You will, for the most part, find that the tubercles, either in the lungs, or in the liver itself, were not all suppurated; and indeed that many of them, at times (*l*), as yet resembled the firmness of a glandular body.

What if, when the patient was dying, there were not as yet any that began to contain pus? And it seems according to those observations wherewith, in my opinion, the observation of Molinelli may be join'd, that the pus carried from other parts into the viscera, is not always deposited in the form of a pus, but frequently at least, that many of its particles, being mix'd with the blood, and entirely disjoin'd from each other, stick in some narrow passages, perhaps of the lymphatic glands, and by obstructing or irritating them, as happens in the production of venereal bubos, and by retaining the humours therein, distend them, and give origin to the generation of a much more copious pus than what is carried thither; which generation is shown by those rigors and horrors (*m*). And by this means we may also conceive how it is, that much more pus is frequently found in the viscera, and cavities of the bodies, than a small wound could have produc'd.

But in what manner not only a few, but even sometimes a great number of purulent particles, pass to other parts from wounds of the head; and not from these only, but also from the wounds of other parts, or their abscesses and ulcers; as when from the lungs of pleuritic patients, and even from suppurated limbs, it is often so evidently carried to the passages of the intestines, or kidneys, that the fœces and urine are purulent, as long as no pus flows from the limbs; and, on the other hand, those excrements are pure as long as the limbs discharge a pus, and sanies, which was the obser-

(*k*) loco paulo ante indicato.
(*l*) n. 17.

(*m*) supra n. 17. 19. 20.

vation of Parey (*n*); is sufficiently explain'd by the circulation of the blood (*); which also illustrates another observation of the same author (*o*), and, to omit those of others, one very excellent observation which is added lately by the very experienc'd Benevoli (*p*). Yet there is not room for these explications, if at any time the wound is dried up, in consequence of the powers of nature decaying: which I here take notice of, that you may also beware of the fallacy of this sign, which is propos'd among those above.

24. The four observations of Valsalva that I have last produc'd, if you except one, which, like the others before produc'd, mentions no injury of the cranium that relates to the internal parts; all of them show it to have been either loosen'd, or depress'd, fissur'd, fractur'd, or eroded. Let us go on, therefore, to describe other observations which relate to each of those kinds of injuries.

25. A woman, of fifty years of age, being busy in washing linen on the bank of a river, was struck, by another woman, on the right and posterior part of the head with a stick, in consequence of which blow she fell into the water. Being immediately taken out, she lay in some measure stupid. But the stupor being discuss'd, and no other symptom appearing, and the hope of her safe recovery being confirm'd more and more every day; behold, about the fourteenth day she was attack'd with a fever, which began with a rigor; of which fever she died about the twenty second day.

The integuments of the cranium being taken off, it was observ'd that behind the right ear, which had been struck, the indentations of the lambdoidal suture were separated from each other; and that from their interstices a little serous humour was, by a slight pressure, discharg'd. And within the cranium, at the same place, a little blood was stagnant. However, the brain was entirely sound.

26. A young man, who was struck with a stick upon the sagittal suture, near to the coronal, pass'd over six or seven days without any bad symptom; so that he did not lie in bed, but walk'd about the hospital. However, about the tenth day the wound was very foetid: and one or two days after that the edges of the wound swell'd; and a certain heat was perceiv'd at the throat. After this a fever attack'd him, with a rigor: he was also attack'd with convulsive motions: and he at length died on the beginning of the thirteenth day.

The cranium, when examin'd externally and internally, did not show the least injury, except that the suture, where it had lain under the wound, had a tortuous little line running betwixt its indentations, which appear'd very evident by a brownish colour. And at the very side of the suture, some portion of the dura mater adher'd to the cranium, in a peculiar kind of manner: this, however, being easily separated, show'd a very slight appearance of sanies adhering to it on the surface. But the pia mater, which lay beneath, was pale. Besides these appearances, nothing was observ'd; for the other parts, as well as the whole brain, were in a natural state.

27. A man, of more than thirty years of age, receiving a blow with a blunt instrument on the upper part of the lambdoidal suture on the left side,

(*n*) Oper. l. 16. c. 49.

(*) Vid. etiam Epist. 25. n. 20.

(*o*) l. 10 c. 12.

(*p*) Observ. 22.

when returning to Bologna from the country, where he had been, fell down, indeed, but immediately rose up; and instantly pursuing his journey, which was in extent three miles, betook himself into the hospital. While he lay there, it was observ'd that the wound was not of a very laudable colour, and that some days after an abscess was produc'd at the side of it: and this abscess being afterwards open'd by art, and in a short time cleans'd, the cure of the wound seem'd to proceed in a much better way.

But many errors in diet being committed, and some febrile accessions having already preceded, about the eleventh day a very violent epileptic convulsion attack'd him: and when this remitted the patient did not speak: although he signified that he understood what others said. After this, convulsive motions were observ'd in the left side of the body; but in the right a paralysis; his face sometimes representing the *risus sardonius* as it were. In the mean while the pulse was natural: but this afterwards becoming quick, turgid, and impetuous, death follow'd in a few days; that is, on the nineteenth day.

Drawing down the skin from the head, under it on the left side, and in many places, although in such as were far distant from the wound, was found a stagnating pus, wherewith the *os temporis* was eroded on the surface. Moreover the lambdoidal suture, where it lay under the wound, had its indentations distinct from each other. And the *dura mater* show'd a kind of cineritious colour, which it had contracted from pus that was collected betwixt itself and the *pia mater*. Part of that pus adher'd to the *pia mater*, in the form of a thick gluten as it were; the remaining part was fluid, and scarcely equall'd half an ounce. The substance of the *cerebrum*, which lay under this portion of the *pia mater*, to the extent of about two inches both in length and breadth, and of one in depth, inclin'd to a somewhat livid colour. However, the remaining parts of the whole *cerebrum* were sound; if you except the existence of a little serum, which was found not only in the ventricles, but also at the beginning of the spinal marrow.

28. An old man, of sixty years of age, falling down from some height, receiv'd a blow upon his head, under the angle of the lambdoidal suture. At first he lay half-dead. But coming to himself afterwards, he complain'd of a pain in the injur'd part: and this continuing he did not, however, confine himself to bed, till the fourth or fifth day, when he came into the hospital of St. Mary de Vita. There he not only could not bear the contact of the probe in examining the wound, but not even that of the lint or tow with which it was wip'd, without a great deal of pain. About the seventh day he was seiz'd with a paralysis of the left arm; to which, upon opening a vein, motion was restor'd; but not in a perfect degree. This patient liv'd quite to the twenty-third day, on which he died in a soporose state.

While the skull was saw'd open about the right temple, pus flow'd out from its cavity: and this pus had been also seen in the place of the wound, while the head was examin'd before cutting into it. But in this place no injury of the *cranium* was found, except a disjunction of the lambdoidal suture. In that part the *cerebrum* had an ulcer on the right side, to the depth of two inches, which had certainly been hollow'd out in this manner by the sanies. But in the nearest part of the left side it was of a palish colour.

colour. Betwixt the dura and pia mater, where they cover'd the whole anterior lobe on the right side, was contain'd a moderate quantity of pus, with the colour of which the meninges had been ting'd. In the ventricles of the brain, and at the beginning of the vertebral tube, a small portion of limpid serum stagnated.

29. The sudden disjunction of the sutures, if you attend to the cause of it, cannot happen without some considerable concussion of the brain; and if you attend to the effect, not without a violent distraction of the dura mater, which adheres more closely in that part than in others, and a laceration of the connecting small fibres and vessels. To this may be added, that the passage for the pus from the wound into the cavity of the cranium, is by this means with less difficulty obtain'd. It is not, therefore, to be wonder'd at, that, in these four observations of Valsalva, and in another, in like manner, which had been describ'd above (*q*), the patients died, sooner or later, where there was a disjunction of the sutures; being affected with more slight or more violent disorders, both according to the various disposition of each, and according to the condition of other circumstances, all of which cannot be known.

But as to a paralysis occupying the side opposite to the wound or the injury; as this has been also observ'd in other patients, of whom I shall write below, as well as in the two last, I shall hint a few things in regard thereto hereafter (*r*). Now let us come from the laxated cranium to the depress'd cranium.

30. A certain herb-man was struck in the forehead, near to the coronal suture, and a little to the left side, with an instrument which was more apt to bruise than to cut. After the blow, he felt the beginning of a slight swooning. Having come into the hospital just now mention'd, till the eleventh day there not only was no symptom of ill success in the cure, but every thing seem'd to portend a happy event. However, on that very day the man was seiz'd with a vehement fever, which began with a rigor, and a vomiting of a great quantity of bile, which return'd again in the evening.

This fever recurr'd every day in the same manner, till, on the fourteenth day from the blow, which was the fourth before the next full moon, the wind blowing pretty nearly from the south, he first became dull, yet so as to answer readily any one who ask'd him a question: but after a few hours, while he was turning himself from the right to the left side, he was depriv'd both of his internal and external senses entirely, and was oppress'd with a difficult respiration; which, although it afterwards was brought back almost to a natural state, yet return'd again in a laborious way: and in this manner he died on the same day that I have mention'd.

The os frontis was slightly depress'd in that place which was pointed out; and an unequal and sharp scale, separated from it internally, which inclin'd to the right side, had injur'd the dura mater on that side; so that betwixt this membrane and the pia mater pus stagnated, which had overflow'd from the vertex of the head almost to the basis of the cerebrum, and the terminations of the cerebellum on the same right side. And the dura mater, which

lay under the pus, being somewhat thicken'd, was easily separated from the cerebrum; which in that place inclin'd to a cineritious colour, not unlike the pus whereof I have spoken. Moreover, the cerebrum was very much confin'd within the cranium.

31. In regard to the brain being very much confin'd within the cranium, and the causes thereof, among which we have seen that some place the full-moon, and to which the state of air, during the blowing of southerly winds, as a cause of expansion and rarefaction in the blood, must be added; both of which Valsalva has taken notice of in this history, you know, that I have written of them above (s). But as to the apoplexy seizing upon this man, while he turn'd himself from the right to the left side, as it has done so many others, according to what has been hinted in the *Epistolæ Anatomicæ* (t); the cause of it, in this case, might be, that the quantity of pus which was on the right side by this means compress'd the cerebrum, which was wholly subjected thereto, in so much a more dangerous manner, in proportion as it was now the more compress'd by reason of the more confin'd space within the cranium.

32. A man, of fifty years of age, being wounded with a cutting instrument on the sinciput, immediately vomited. Being receiv'd into the same hospital, the bone was found to be so depress'd under the wound, that it could not be drawn back by any art whatever. In the beginning there was no pain in the wound; but after some days it was affected with the sense of a creeping motion. And to this convulsive motions of the whole body being added, on the beginning of the eleventh day life was exchang'd for death.

That portion of the bone which had receded from the other by the force of the percussion, adher'd strongly to the dura mater, which was there slightly inflam'd. Betwixt this and the pia mater was a fluid similar to serum, both in consistence and colour.

33. A woman, who was about the same age, was wounded with a blunt instrument above the left eye-brow. After the blow, she vomited and became stupid. Yet the stupor was, after some time, dissipated; and the case seem'd to the surgeon to be going on very well, till, the tenth day being elaps'd, she was seiz'd with a pain of the left ear, together with a horror and a coldness, which was succeeded by a heat. At length, convulsions of the whole body coming on, she died within a few days.

The bone which lay under the part where the blow was receiv'd, had wounded the brain by an acuminate lamina; and the brain was, for that reason, sanious in this part, and corrupted. But although the disorder had descended very deeply, it did not, however, reach to the ventricles. Part of the sanies had flow'd down to the basis of the cerebrum, about some of the pairs of the nerves.

34. A woman, of thirty years of age, had been struck upon the head with many stones; a languor and vomiting being the immediate consequences thereof, which continu'd for many days. Yet the wound did not seem to promise an unhappy event. But about the tenth day, a fever coming on, with a coldness, it became dry and pallid. To these changes was added a

(s) N. 10.

(t) XIII. n. 24.

delirium, which degenerated gradually into a soporose affection. And by this the patient was at length carried off about the twentieth day.

In the right side of the cranium was found a fissure of four inches in length; yet that portion of the cerebrum which lay under the fissure, was affected with no injury. But on the left side, where there appear'd to be a very considerable contusion externally, the cranium was not only cleft by a fissure, which was drawn in the form of a circle, and had a diameter equal to half an inch of the measure of Bologna; but it was also, in some measure, depress'd in that part: and, indeed, from that depress'd portion an acuminate lamina had receded internally, and had wounded the dura mater. To this membrane, therefore, a purulent matter adher'd in that part; and the cerebrum, which lay beneath, was morbid to the extent of three inches both in length and breadth, and to the extent of two in depth; so that the injury did not reach to the ventricles.

35. A man, of a middle age, being struck in the right part of the scaput with a blunt instrument, but affected with no symptom whatever in consequence thereof, came of himself on foot to the afore-mention'd hospital, and went to bed there. After two hours he began to stammer; and, a few hours after that, was seiz'd with a paralysis in the whole left side of his body.

He, nevertheless, open'd his left eye perfectly, when he answer'd, in a stammering manner, to the questions which were ask'd him: the right he kept half shut. But he could not even move the right part of his body, without great pains and endeavours. Two or three days after receiving the wound, he was delirious. At length, becoming lethargic, he died on the fifth day.

The head of this man Valsalva, indeed, could not himself dissect, being taken up with more important business. Yet he did not omit to mark down what was related by his friends, Peter Molinelli and John Anthony Guicciardini, who had dissected it. The cranium was broken in such a manner, that two large fragments of it, being depress'd, had, by making an angle inwards, as it were, made a considerable wound in the meninges and the brain itself, and had penetrated into the substance thereof, to the breadth of two inches. There was in that wound of the cerebrum a coagulated blood; and the vessels, also, were turgid with blood to a considerable degree. While the brain was taken out of the cranium, some portion of serum was discharg'd.

36. As to my heaping together so many observations here, I do not do it so much for the sake of brevity; for many things remain to be added; as to prevent the same animadversions from being frequently repeated. For those things that seem to be worthy of peculiar attention, in any one of them, I will take notice of below in their proper places. In the mean while, however, let us not stand still: but, as we have done in the examples of the cranium being depress'd, let us, moreover, subjoin other observations of its being broken or fissur'd.

37. A woman, of fifty years of age, fell headlong from a ladder upon the ground. A wound appear'd above the left eye: her face was tumid and pale; her temples were livid: blood was discharg'd from her mouth. The
woman

woman understood nothing, felt nothing, mov'd nothing except her right hand, and that only a little while, slightly, and feebly. She died fifteen hours after her fall

The external integuments of the sinciput were red. In the bone which compos'd the superior part of the orbit of the left eye, were many fractures. On the right side, the artery which passes through the dura mater, being lacerated, had pour'd out its blood; about two ounces of which were seen to be coagulated betwixt that membrane and the os petrosum. This blood, thus concreted, had injur'd that part of the cerebrum which corresponded to it, so as to make it appear as if it were eroded.

38. An old man, of sixty years of age, being attack'd by a he-goat, fell down on the ground, and hurt the left part of his head. He could scarcely speak: he vomited: he threw out blood from his mouth: he gave no sign of any internal senses: his hands were agitated by convulsive motions: his face was red: he therefore died after two days.

The injury of his head, which was about the upper margin of the temporal muscle on the left side, seem'd to be slight externally. But when the skin was taken off, that muscle was found to be universally suffus'd with blood: and when the cranium was open'd, a considerable quantity of grumous blood was found to adhere so tenaciously to the dura mater, where it corresponded to the same muscle, that it seem'd to be one substance therewith. And in the same place there was a fracture of the skull, with a rupture of the internal vessels.

However, as to the same membrane, where it corresponded to the right temporal muscle also, a still larger quantity of the same kind of blood adher'd, and could not have come thither by any means from the left side; and as no fracture of the cranium was, by any means, discover'd on the right side; Valsalva was very much suspended in his mind thereon. For although, when he was afterwards about to examine the bony fabric of the internal ear, a subject on which he was then wholly employ'd, and had driven a chissel against that right part of the cranium with a mallet, a fissure came into his view; yet he was in doubt whether this was to be ascrib'd to the mallet, or to the blow receiv'd in falling. As to what remains, the whole brain was in a natural state, if you except a little serum which was in the ventricles.

39. A man, of fifty years of age, was struck with a stone almost in the middle of the left eye-lid, where the nerve goes out from the orbit. Many hours being elaps'd after the fall, he was carried into the hospital I have so often mention'd, where it was necessary to tie him down in bed, on account of the very great convulsive motions whereby his whole body was agitated. His eyes were shut: the actions of his mind were at rest. At length, when the thirty sixth hour from the time of receiving the blow was completed, the convulsive motions having ceas'd for the last hour, he died.

Many portions of the cranium, above the orbit, were broken; and one of them that was acute prick'd the dura mater, which for this reason was inflam'd in that part. And, indeed, a fissure was also found on the opposite, that is, on the right side, in that very part which corresponded to the fractur'd bone on the left side. In the brain was found a serum in some measure sanious.

fanious. However, as the head of this man had been wounded before also, you might see, in that part from whence a fragment of the cranium had been taken away, a kind of thick membrane, which supplied the place of a bone. To this membrane the dura mater strongly adher'd.

40. Besides this last circumstance, which you will see agrees extremely well with what was observ'd formerly by Berengarius (*u*); and besides that which relates to the nerve reflected under the eye-brow, the very injury of which is also succeeded by violent convulsions, as has been shown above (*x*); this observation contains two other circumstances, whereon we may insist a little. One of these, however, I shall more conveniently touch upon below (*y*). And the other relates to that celebrated controversy in regard to the counter-fissure. Which most persons were formerly induc'd not to acknowledge, by a reason that was weak, nevertheless, in consequence of its depending upon that utility of the sutures of the cranium, which they, following Galen (*z*), ascrib'd thereto, as if they were created to stop the progress of a fracture; whereas fissures may be known to every one, as well as to us (*a*), which are produc'd from one bone of the skull into another, and even frequently into more than one.

Another difficulty likewise offer'd itself in regard to this question; I mean, to confess the truth, that the case cannot be so plainly and clearly explain'd by any reasonings or similitudes whatever, as to make every one acquiesce therein. However, although the explications, which are now read in the dissertation of Georgius Wolfg. Wedelius, *de Contraffissura* (*b*), were not as yet brought to light; it was not just to deny any thing for this reason, that the cause of it is not understood. Finally, the opinion of most persons was moreover with-held by this argument, that very eminent anatomists and surgeons, out of whom it is sufficient to mention Jacobus Berengarius (*c*), Gabriel Falloppius (*d*), John Baptist Carcanus (*e*), Isbrandus Diemerbroeck (*f*), in so many cases of fractur'd skulls, and in so many inspections of them after (which I mean to say of Carcanus in particular, although I see none of his observations transferr'd into the Sepulchretum) had never found the bone fissur'd in the part opposite to the blow.

From hence, indeed, we might have argu'd the rareness of the counter-fissure; but could not have denied its existence, if, at the same time, it were only certain that it had been actually sometimes found by others. And that it has been found, not only many not recent, but even many recent, observations are extant to confirm: and as you have some of these here in the Sepulchretum, not under number five, as is erroneously said by the printers, but under number eleven (*g*), and others in the dissertation of Stofchius *de Resonitu* (*h*); I shall not take notice of them here.

Yet I will put you in mind of this, which Paulus (*i*) formerly hinted, that

(*u*) Tract. de Fract. Calvar. in Document. prope fin.

(*x*) n. 16.

(*y*) n. 48. in fin.

(*z*) De Us. part. 1. 9. c. 17.

(*a*) Epist. 52. n. 35. 36.

(*b*) Sect. 1. membr. 3.

(*c*) Tract. cit. c. 1. & 2.

(*d*) De Vuln. c. 12. & Expos. in Gal. de Off. c. 13.

(*e*) De Vuln. capit. Serm. 2. Lect. 6.

(*f*) Anat. 1. 9. c. 4.

(*g*) § 2. 5. 7. 8. 9. (*h*) c. 4.

(*i*) De Re Med. 1. 6. c. 90.

the head being stricken in more than one part, "as happens in falling, the fissure of the scull, which is brought on without a solution of continuity in the skin, but appears afterwards, in consequence of an abscess being form'd around it, and the skin being cut through, was suppos'd to be made in the part opposite to that on which the blow was receiv'd;" I will, I say, put you in mind of this, as it is necessary that it should be cautiously and prudently attended to in the examination of every observation. For which reason Falloppius (*k*), although in one person he saw the bone fractur'd on the side opposite to that which had been struck by the kick of a horse, as there was a suspicion that this fracture had been produc'd by being dash'd against the ground, nevertheless thought he could not assert that he had seen a counter-fissure.

And Berengarius, Carcanus, and Diemerbroeck, have judg'd nearly in the same manner of this counter-fissure, when describ'd by others: and very often, at least, the patient cannot speak, or remember how many blows he receiv'd, or in what places, or on what part of the head he fell. This must be attended to besides, whether the fissure which is describ'd in the opposite part be there only, or whether it be produc'd thither, beginning from the part which was evidently struck, or from some other very near to it.

When thus continu'd, it is not properly the counter-fissure, of which the question is at present; for they suppose, with Celsus (*l*), "that the gaping of the bone is not found on that part where the skin is cut asunder;" but that the bone is "fissur'd on the other side." If you, therefore, observe these things, you will perhaps find much fewer examples than some may imagine, in which you will think it reasonable to allow of a counter-fissure.

41. Nor indeed is it properly a counter-fissure, if it at any time appear, that one and the same of the bones of the cranium had receiv'd a blow in one place only; and yet that it has a fissure, not in that place, but in some other: for that this may actually happen, was not denied by Carcanus (*m*), and his preceptor Falloppius (*n*). And, indeed, the latter of these authors has shown (*o*), that in this manner the words of Hippocrates (*p*) may be understood, in which others have believ'd that the counter-fissure, properly taken, was evidently spoken of; that is to say, that the bone is sometimes broken in a part of the head distant from that where the wound is; for if he had intended to speak of the opposite side only, there was certainly no reason why he should consider it as a great calamity (which he immediately subjoins) that the physician is then ignorant in what part of the head the fracture has taken place; as, by the general signs of a fracture then existing, it would be certain that it was in the opposite side.

But I do not see why he would not have (*q*) Celsus interpreted in the same manner, and by a similar kind of reasoning. For Celsus (*r*), where the marks of a fractur'd scull are found, and these he does expressly suppose to be found, but the fissure does not appear under the wound, would not have

(*k*) c. 13. cit.

(*l*) De Medic. l. 8. c. 4

(*m*) Lect. 6. cit.

(*n*) c. 12. cit.

(*o*) Comm. in Hippocr. de Vuln. Cap. c. 14.

(*p*) De Cap. Vuln. n. 10. apud Marinell.

(*q*) c. 12. cit.

(*r*) c. 4. cit.

enquir'd after other signs of the part wherein the cranium is fractur'd, if he had meant only the opposite part; since he has said, "And it does even not uncommonly happen, that the blow has been receiv'd in one part, and the bone has been fissur'd in another."

Be cautious, therefore, how, rather than give credit to Carcanus (*s*), you here give credit to John Baptist Cortesius (*t*), who readily affirms, "that the more elegant Latins, by the *altera pars* of any thing, always understood the opposite part." For if this author had attended, but a little while, to the words of Celsus, just now copied by me, he would not even have written, a little before, that Celsus, in this passage, "had spoken according to the opinion of the vulgar," and not according to his own.

But much less are we to reckon among the instances of a counter-fissure, as has been done by some, those in which there has happen'd to be either extravasated blood, or sanies, or any other mark of disease whatever, found within that part of the cranium which is opposite to the blow, at the same time that the bone was there uninjur'd. Since, altho' Berengarius (*u*), Fallopius (*x*), and others, assert, that they have found these appearances in many, yet they, at the same time, deny that they had seen a counter-fissure. For this is never understood by them, and the more ancient authors, unless the bone be fractur'd: and in what manner the vessels may be ruptur'd, in the opposite part, under the uninjur'd bone, not only they have explain'd in their own way, but may be conjectur'd from the dissertation of Wedelius (*y*), which I have already commended.

Wherefore, if you even suppose that no part of the scull, besides what evidently appear'd to have been struck, was struck in that young man (*z*), and in that man (*a*), in whom, in the same manner as I shall say in the next observation, I have said above, that a sanies and marks of injury appear'd to Valsalva in the opposite part; you will have from whence to explain the affair, as in a woman in like manner (*b*); although in her it is more natural to suppose many blows; and in the old man (*c*), in regard to whom I last of all wrote that blood was extravasated in the opposite side. And from those things which I have taken into consideration, in relation to the word counter-fissure properly, or less properly, taken, you would, without doubt, choose rather to ascribe the fissure observ'd in the opposite bone, in the same old man, to the anatomical mallet, but that which was seen in him (*d*) whom we immediately describ'd afterwards, to the one hostile blow, inasmuch as it was not, like the former, found in a different and not contiguous bone, but in one and the same.

42. A man, of thirty years of age, who was very delirious from an acute fever, threw himself down from a window upon the ground, and wounded the left side of his head, above the temporal muscle. He could not speak: his face was red: the whole left side of his body lay immoveable; except that an hour or two after the fall, while the wound was handled, the foot con-

(*s*) Lect. 6. cit.
 (*t*) Traët. de Vuln. Cap. P. 2.
 (*u*) c. 1. cit.
 (*x*) c. 12. 13. 14. cit.
 (*y*) Sect. 1. Membr. 3. & 4.

(*z*) n. 5.
 (*a*) n. 7.
 (*b*) n. 37.
 (*c*) n. 38.
 (*d*) n. 39.

tracted itself slightly, and was afterwards extended. And in this manner he liv'd till the third day, when he died.

Under the left temporal muscle was a fissure of the skull; to which, however, no internal injury that fell under the notice of the senses corresponded. But in the part opposite to this, betwixt the dura and pia mater, was blood extravasated to the quantity of about two ounces; so that the hemiplexia of the left side was brought on by this extravasation, and not by the wound or fracture on the same side. However, the whole cerebrum was sound, except that all the vessels which crept through the pia mater, were very turgid with blood, and the neighbouring parts in some measure inflam'd: but these appearances, probably, related more to the delirium than to the blow.

43. You see how easily any one might be deceiv'd, who, considering only the situation of the wound, should take upon him to judge of the seat of the cause by which the hemiplexy was produc'd. For that this ought not to be done will, in like manner, appear from an observation of mine similar to this, which you read in the *Epistolæ Anatomicæ* (e).

But to the seat of the cause of a hemiplegia of this kind, which was enquir'd after by dissection, as it ought to have been, besides others which are describ'd above, that history also belongs which I shall immediately describe: for the other circumstances that occur in the history last describ'd, either in regard to the blood being found in the part opposite to the wound, or in regard to the vessels being very turgid with blood in a delirium, you remember I have spoken of just now in part, and in part on a former occasion (f).

44. A young man, of twenty years of age, being struck by a sharp instrument, had the left temporal muscle cut in a transverse direction. After the blow he proceeded on his way for a little time, but at length fell down, and lost the power of speech. However, to those who ask'd him questions he answer'd by nods, though slowly. Being brought into the same hospital which I have so often mention'd, after some days had pass'd he spoke a little, though deliriously. In the mean while, he mov'd his right hand no more: yet if this were prick'd, the patient shew'd that it felt pain. About the fourteenth day he died.

The cranium being open'd, it was found that the wound, which had not only cut the temporal muscle, but the bone, had penetrated deeply into the brain; and that a serous colluvies, which was found there, had, moreover, eroded the brain: so that the erosion penetrated quite into the left ventricle. And as a serum not unlike this was discharg'd about the fella equina, while the brain was taken out, it was probable that it had flow'd down thither, from the same ventricle, through the infundibulum.

45. A young man, about two-and-twenty years of age, receiv'd a very great blow with a cutting instrument, by which he was wounded at the upper part of the left temporal muscle. He immediately fell down, and lost his speech; so that he scarcely seem'd to be alive. After which, the power of speaking, and all the other faculties, were restor'd.

(e) XIII. n. 16.

(f) Epist. 7.

But about the fourth day his *aphonia* return'd; although, after that, he sometimes brought out a few words, yet seldom only: and with the *aphonia* were join'd convulsive motions; but these in the left part of the body alone sometimes, and slight; yet in the whole right side of the body, they were continual, and so violent, that the body seem'd sometimes to be curv'd to this side. During the torture of these symptoms, nevertheless, the patient shew'd, by nods, that he understood what was said. However, as the fever increas'd every day, and the convulsive motions, at length, grew weaker from a decay of bodily strength, having even quite ceas'd some hours before death, he died about the thirteenth day.

The wound had not only penetrated through the temporal muscle, but had descended, through the bone that lay beneath, deep into the substance of the brain. The dura mater was become much indurated about the wound. About the same, and within it, a sanious humour was found; from the pungent nature of which, perhaps, the convulsions had been excited: at least, though the wound seem'd to have reach'd so far as to be only an inch distant from the left ventricle, yet it did not appear that the instrument had penetrated so far, but that the excavation had been made deeper by the eroding juices which were generated in the wound. In the ventricles of the brain a little serum stagnated.

However, that in this young man, the left part of the brain being injur'd, the convulsions were most violent in the right side of the body, Valsalva thought was to be referr'd to the same cause as the paralysis, which he had before always observ'd in the side of the body opposite to the injury of the brain.

46. Among those observations that have been hitherto describ'd from him, you have one (*g*) wherein, although there was a paralysis of that part of the body which was opposite to the injury of the brain, yet certain epileptic convulsions, as it were, sometimes agitated this paralytic side, no less than that which was not paralytic. But you have another (*h*) also, wherein, although the opposite side was in like manner paralytic, convulsive motions were observ'd in that side which was not paralytic.

Yet you have not one in which the circumstances occur'd in a contrary manner to what they did in that other observation: and this, certainly, agrees perfectly with that "universal theorem" of Salicetus, which I have mention'd in the thirteenth of the *Epistolæ Anatomicae* (*i*): where, however, I have not even conceal'd the dogmata of those (*k*), who have not only asserted that a paralysis, or convulsion, happens promiscuously in one or the other side, but also that, for the most part, the side which corresponds to the wound is seiz'd with a palsy, and the opposite with a convulsion. With whom Bal-lonius so far agreed, that, in his little book upon convulsions, he took upon him to explain this question in particular, which he also has propos'd in the very beginning of his book, "Why those who are wounded in the right side have a convulsion brought on in the sound part," that is, in the part opposite to the wound.

(*g*) N. 11.(*h*) N. 27.(*i*) N. 14.(*k*) N. 15.

To this supposition they were impell'd by the dogmata of the ancients, particularly of Hippocrates; who repeats the same thing in so many places, that Marcellus Donatus (*l*), when he referr'd to them in particular, being overwhelm'd, as I suppose, with the number of them, forgot that which was quoted by me in the epistle I have mention'd (*m*); in which, however, that very ancient preceptor (*n*) has expressly taught, that those who are wounded in the head "become disabl'd in the left side, if the wound is in the right; " but if the wound is in the left side, in the right:" than which nothing can be more clearly said; although Donatus asserts, "that Hippocrates has "no-where, as far as he remembers, spoken of a paralysis of the opposite "part."

But as to those more ancient authors, and many of their followers, imagining that not the latter, but the former, happens the most generally; I should suppose it to have arisen in great measure from hence, that as they did not dissect the heads of those who died, they argu'd, from the seat of the wound, which they saw in the head, the seat of the injury also that was brought on in the brain: or, if they sometimes saw this injury to lie under the wound, by reason of the cranium being perforated by the blow itself, or by their instruments, during the course of the cure; they, at least, did not at all suspect that the greater and principal wound might be in the opposite part of the brain; contrary to what anatomy has taught us that we are to suppose, as has been demonstrated above (*o*).

47. However, I do not say this because I am ignorant that the side of the body which is opposite to the side of the brain that actually labours under the principal injury, is frequently seiz'd with a convulsion. For I very well remember what was related to the Royal Academy of Sciences at Paris (*p*) by Poupert, from his own anatomical inspection; and, in like manner, from that of Chirac: nor am I ignorant of another certain observation, as it is one which is transferr'd into this section of the Sepulchretum (*q*). But I say it for this reason, that you may perceive what kind of observations I would also have to be attended to here, before it be determin'd by us what happens for the most part.

For they are not to be reckon'd up, but to be consider'd, and not to be admitted, unless the dissection of the head was perform'd. And this was perform'd in that observation of Massa which is mention'd above (*r*); just as in a great number which are either describ'd from Vallalva, or read in the Sepulchretum; as that of Diemerbroeck (*s*), Dodonæus (*t*), Horstius (*u*), and Reifelius (*x*); in all of which you see, that the side of the body which was opposite to the injury of the brain, is describ'd as having been affected with a paralysis, and not with a convulsion. And, indeed, you see that those in which a convulsion of one side, and a resolution of the other, are observ'd,

(*l*) De Hist. Med. Mir. l. 5. c. 4.
 (*m*) N. 14.
 (*n*) Epid. l. 7. n. 19. apud Marinell.
 (*o*) N. 43.
 (*p*) Hist. A. 1700. Obs. Anat. 19.
 (*q*) Obs. 7. § 2.

(*r*) N. 21.
 (*s*) Obs. 3. § 2.
 (*t*) Obs. 4. § 10.
 (*u*) Obs. 8. § 9.
 (*x*) In Addit. ad hanc 3 Sect. Obs. 24.

show this latter to have been in the opposite side, and the former in that which was the subject of the wound : of which observations one is of Salmuthus (*y*), who, moreover, affirms that it generally happen'd thus ; and the other of Ballonius himself (*z*) : although, to speak of no other faults, it is not said in the Sepulchretum, by the carelessness of the printers, what limbs were paralytic. And to this carelessness I wish I could refer a blunder diametrically opposite to this : as when the observation of Fontanus is repeated (*a*) ; or when another, in like manner, of Bartholin (*b*) is repeated, which would relate to the question in hand, if it had been remark'd in which side the limbs (for both sides are mention'd) were first or most affected with palsy.

48. Yet even of those who seem to have attended to nothing but the external seat of the wound, there were not wanting learned men who receded more or less, even before these times, from that dogma of Hippocrates, which is so frequently inculcated. Thus Donatus (*c*) has also taught that the contrary happens. Thus Cæsalpinus (*d*), from a review of those passages of Hippocrates, says, " Yet in these days we frequently see not only a convulsion, but also a paralysis, arise in the same manner ;" that is, in the part opposite to the wound. So Martianus (*e*), after speaking of convulsion in that part, goes on to speak of resolution, and asserts as follows : " Experience, indeed, has shown us, that the resolution always happens on the opposite side."

And, indeed, before those, Carcanus (*f*) had expressly said these things : " Not the part corresponding to the wound, but the opposite, is always affected with a palsy ; as Hippocrates has very justly said, and as experience has taught us. It is true, that Hippocrates has said the opposite side is affected with a convulsion, and not with a paralysis ; but I say, that it is rather affected with a paralysis : " and this assertion of Carcanus is not only confirm'd by many others, but by that remarkable observation of the celebrated Daniel Hoffman (*g*) ; who observ'd, in a boy that had suffer'd " a concussion of the brain, on the left side, with a considerable loss of substance," a very violent convulsive agitation of the left foot, and a paralysis of the right side, which had made it altogether immoveable. And they, indeed, determin'd the seat of the cause of both affections to be in the same side of the brain, which is opposite to the convuls'd or paralytic side of the body ; but have determin'd the cause of one of the affections to be different ; as, for instance, an irritation, or an inflammation, if it be a convulsion ; but a compression, or a rupture, if a paralysis.

In this manner, also, or a similar manner, is to be understood what Valsalva has suppos'd in regard to the young man in question (*h*), that convulsions are, in general, to be referr'd to the same cause that resolutions or paralyyses are in others. But why the effects of this or that cause discover themselves in the opposite part of the body, you will not easily understand, unless

(*y*) Sect. ead. Obf. 3. § 7.

(*z*) Obf. 17. § 1.

(*a*) Obf. 5. § 7, & 8.

(*b*) Obf. 4. § 6, & 7. conferend. cum l. 1. S. 15. Obf. 27. § 2.

(*c*) C. 4. cit.

(*d*) L. 2. Quæst. Medic. 10.

(*e*) Annot. ad Hippocr. Epid. 1. 7. S. 1. vers. 377.

(*f*) De Vuln. Capit. Serm. 3. lect. 5.

(*g*) Dissert. de hac rarissima sanatione.

(*h*) N. 45.

you suppose some decussation. And this they suppos'd, and long before them others; in regard to which controversy I have already sufficiently shown (i) what seems to me the most probable.

Nor, although some do not so well approve of that decussation, which they themselves say was formerly approv'd of by Hippocrates, and do not think that the origin and the effect of the spinal nerves ought to be deriv'd from the medulla oblongata, or higher; can I agree with them, unless they first show how a paralysis of the whole body is the consequence of a considerable injury of the brain only; or how we can give a satisfactory answer to the question propos'd by any other supposition, whether a convulsion or a resolution happen in the opposite side.

Moreover, of those who, with us, suppose the resolution, for the most part, to happen in the opposite side, there are who say that a convulsion happens in the other side; because the muscles on one side being resolv'd, those on the opposite side prevail over them, and contracting themselves, draw the lower jaw, or the trunk of the body, or curve it, to that side on which the contracting muscles are.

But to omit enquiring whether this contraction could properly be taken for a convulsion, or if it could, what it relates to those convulsive motions of which we here principally treat; at least, I will make the same enquiry which Cæsalpinus (k) made, from those who were nearly of the same opinion even formerly: "What injury of the opposite muscles can be suppos'd, if the whole arm is convuls'd, or a leg, from a wound of the head in the "opposite part," or in the corresponding parts? For the muscles of one arm, or leg, are not antagonists to those of the opposite arm or leg; and in the limbs it is that those convulsions whereof we speak at present occur.

This was also observ'd by Thomas Bartholin (l), in a boy in whom, from a wound of the right temple, not only the nostrils and mouth were convuls'd on the left side, but also the arm. For he has written those things, such as they are, that are contain'd in the latter end of the scholium affix'd to the second article of the eighth observation in this section of the Sepulchretum; although it does not there appear from what author they are taken. And, certainly, if I may be allow'd to add this, in order to explain paralyfes which happen in the opposite side, we are oblig'd to have recourse to the decussation of the nervous origins, still higher than from the medulla oblongata; as has been already shown (m) from the resolution of the opposite tunica retina: and this we might now confirm from the observation of Peyronius (n), of the sight being lost in the eye of one side, or restor'd, as often as either pus was retain'd in the opposite part of the cerebrum, where there was a deficiency of the substance of this part, whereby the corpus callosum beneath was press'd upon; or was taken out from thence, whereby the pressure was remov'd: and, in like manner, from another of the celebrated Petzcius (o), who, when the left hemisphere of the cerebrum was wounded in such a

(i) Epist. Anat. 13. n. 17. usq. ad 22.

(k) Quæst. cit. 10.

(l) Cent. 5. Hist. Anat. 2.

(m) Epist. indic. n. 18, 19, 21.

(n) Commerc. Litter. A. 1731. Hebd. 30. prope fin.

(o) & A. 1730. Hebd. 34. n. 2.

manner, that a great part of its substance was torn away and lost, not only observ'd both limbs, on the right side, to be depriv'd of the power of motion, but also observ'd the sight to be obscur'd on the same right side, and scarcely any power of hearing to remain. Since then we are under a necessity of allowing this decussation, in order to explain a paralysis in the opposite side, why should we not acknowledge it in order to explain a convulsion?

However, Valsalva gives us the reason why, in the young man of whom we spoke last, those very violent, constant, and long-continu'd, convulsive motions ceas'd some hours before death; when he says, that they went off from a defect of bodily strength. So also those extremely violent convulsions, which are describ'd above in a certain man (*p*), had ceas'd to be troublesome in the last hour of life. And there seems to have been the same cause why, in another man (*q*), and, in like manner, in a woman (*r*), the delirium at length degenerated into a fatal lethargy. But now let me give you other observations of the skull being fissur'd.

49. A young man of twenty years of age, was wounded with a cutting instrument, in the left part of the occiput. No symptom was observ'd after the blow; and in the beginning the cure promis'd success. Yet in the progress of a few days the parts about the wound swell'd very considerably. On the twelfth day a fever came on, with a rigor and a delirium; and on the fourteenth day the patient was carried off.

While the body was taken away from the bed after death, a considerable quantity of blood flow'd out from the wound. And as soon as the dissection was begun, the whole part of the head which had swell'd, was found to be turgid with blood. And although the instrument, wherewith the wound was inflicted, had left only a slight incision on the external surface of the bone, yet at the side of this incision was a fissure; and the dura mater which corresponded thereto had a purulent matter strongly adhering to it: at the same time that the part of the cerebrum, which lay beneath, had chang'd its natural colour into black, in some measure. Besides this, there was nothing worthy of observation in the whole remaining part of the cerebrum.

50. A man about thirty years of age, fell from a high place upon the ground. He lost his speech, and all his internal senses. He vomited at first, after which only an endeavour to vomit remain'd: convulsive motions came on: his face was red: his pulse was turgid: blood burst forth from his nostrils and his left ear: he breath'd with difficulty: and within twenty-four hours after his fall he quitted this state of existence.

On the left side of his head the temporal muscle was contus'd, and the branches of the temporal artery were lacerated. When that muscle was taken away, about two inches above the ear, was found a fissure of the cranium, in the form of an arch: and near to this fissure was coagulated blood, to the quantity of two ounces, betwixt the cranium and the dura mater; which membrane was nevertheless found, as the other parts of the brain were also.

In the belly, the stomach was turgid with air; as the lungs were also in the thorax, and especially the right lobe: both of them being red, and not at all adhering to the parietes. The pericardium contain'd little or no serum: the ventricles of the heart contain'd a little frothy and fluid blood.

51. Another man, of fifty years of age, being struck by a horse, which had run loose without his bridle, was thrown on the ground with such a force, that when the hinder part of his head was dash'd against a stone, the crack of a broken bone was plainly heard. At first he lay half dead: a little after he endeavour'd to speak, but his words could scarcely be understood. From his right ear, from his nostrils, and from his mouth, was blood discharg'd; and by the fullness and redness of his face, he seem'd to be almost suffocated. He was also attack'd with a vomiting; which soon after return'd with such a violence, that he was suppos'd to be giving up the ghost. About half an hour after the fall, he no longer show'd any sign of sense, nor yet of motion; except that once or twice he shook his head, and that he still had the natural motion of respiration. His face was sometimes livid, but for the most part pale. Finally, when twelve hours were elaps'd, he began to breathe slowly; so that to have argu'd from what generally happens to others, it might be suppos'd that he was about to die in a few moments of time. Yet he drew his breath in this manner for two hours, and died on the fourteenth hour after receiving the blow on his head.

The middle of the os occipitis, but a little more to the right side, was cleft asunder into a very large and wide fissure; which being produc'd, thro' its basis, to the foramen magnum, and cutting this obliquely, reach'd quite to the petrous process. And a great quantity of extravasated blood was found under the basis of the cerebrum, and in the anterior part of it also, betwixt the dura and pia mater.

52. By what means it could happen in this man, that, although the occiput was fissur'd, a quantity of blood was, nevertheless, found to be extravasated in the anterior part of the head, likewise, betwixt the meninges, you will very well conceive from what I have said above (s): although, as there was a great quantity of blood under the basis of the cerebrum, a part of that might, perhaps, have been carried forwards also, betwixt the meninges.

But if this was not the case, vessels, and these very considerable ones too, are not wanting, which passing from one of these membranes to the other, may be very easily broken in great concussions of this kind; especially if they are very much distended. And at the same time, others may be broken, on the outside of the cavity of the cranium, from whence blood may flow out by the ears, the nostrils, and the mouth. And these circumstances may the more easily happen, if the fissure reaches to the petrous process, as it did in this man; or if the blood, as in the former, be extravasated near the new foramina of the tympanum, betwixt the cranium and the dura mater. For that there is a passage, by these foramina, into the cavity of the tympanum, and from this cavity, through the eustachian tube, into the nostrils, and

fauces, there is no necessity for me to demonstrate here, as I have already written sufficiently on this subject in a former work, and even of the discharge of blood from the cranium by these passages (*t*).

53. A certain man, being wounded with a cutting instrument in the anterior, and, in like manner, in the posterior, and left part of the head, and being receiv'd into the hospital so often mention'd, began, on the fourth day after his wounds, to complain of very severe pains therein; which, within a few days, had even spread over the whole body. On the sixteenth day he was depriv'd of the power of speech; and then, having lost the use of all his internal senses, he at length died on the twenty-fifth day.

The wound, which was receiv'd anteriorly, had reach'd quite to the beginning of the medullary substance of the brain. And the posterior wound had pass'd above the transverse process of the dura mater, and had penetrated into the cerebrum, quite to the cavity of the left ventricle. In that ventricle was contain'd a considerable quantity of serum, which, when laid upon the tongue, left a biting taste for a long time together; so that, from the acrimony thereof, it might seem reasonable to account for the irritation of the genus nervosum; and from this irritation, perhaps, those universal pains of the body.

54. A husband-man, about forty years of age, was wounded by another husband-man, almost at the right side of the sagittal suture, with a bill, the beak of this instrument being driven in so deep as to reach within the cerebrum. His whole body was seiz'd with a trembling immediately upon the blow: his intellectual actions began to be retarded: and in all the parts of the left side the power of motion began to be diminish'd, till about the fourth day it was entirely lost: the sense of feeling still remaining. His face was very red; his internal senses were obscur'd; his respiration became deep, and his pulse weak. Finally, a reddish matter being thrown up from the mouth, he died on the seventh day.

The upper part of the cranium being cut off (which was not only perforated with the wound, but had also a bony scale rais'd up from its usual situation) while the dura mater was cut into, about the beginning of the medulla spinalis, in order to extract the brain, a considerable quantity of blood flow'd out. However, the wound, perforating the longitudinal sinus, reach'd from thence quite into the left ventricle; in which some serum, with a grumous blood, was conceal'd: and in the basis of the same ventricle was seen a fordid ulcer. In the thorax, the left lobe of the lungs was very turgid from stagnating blood.

55. It is natural to suppose it had happen'd to Valsalva, at the time of writing, as frequently is the case, that instead of the right ventricle, which lay under the wound, he set down the left; by reason of no animadversion being added or interpos'd. For he who was wont to find the injury of the brain, in that side which was opposite to the paralytic side of the body; as from the many observations which are describ'd above (*u*), and from what he has expressly added under number forty-five, very evidently appears; if he

(*t*) *Epist. Anat.* 6. n. 6. & seqq.

(*u*) n. 11. 17. 27. 28. 35. 42. 44.

had

had now seen the contrary in this husband-man, would certainly not have omitted to make some remark on so unusual an appearance.

Yet this I do not say because I think it impossible for that wound to be turn'd aside, by a slight obliquity, from the right ventricle into the left, especially as it lies so near; or because I myself never dissected bodies which had the injury in the hemisphere of the brain that corresponded to the paralytic side of the body. For in the thirteenth of the *Epistolæ Anatomicæ* (x), I have not only pointed out some observations of this kind, made by others, but have even propos'd my own; although I have not conceal'd (y) what may still be wish'd for in some of them, and in what manner we may explain both mine and the others, without overturning the dogma of Valsalva. And from thence you will, perhaps, be able to collect some things, in order to explain this observation also; not to say if any thing that is advanc'd in the observation under number thirty-five, in regard to the eye-lids, seems not very well to correspond thereto.

56. I will now put the finishing stroke to this letter, by the histories of two wounds, which were both of them inflicted by a sharp-pointed instrument; but are such as deserve the more attention, by reason of the stroke appearing so slight in both of them, and by reason of their seeming to belong to the face rather than to the brain.

57. A man of thirty years of age, of a bilious temperament, being struck, with a sharp-pointed instrument, about the right eye, pass'd over the space of three days without any sensible injury of the animal actions. On the fourth day he came of himself into the hospital so frequently mention'd: and on the same day he died; contrary to the opinion of the physicians; because there appear'd to be no where any mortal wound, but only a simple contusion on that eye.

The skull being open'd, and a small quantity of purulent matter being found betwixt the os frontis and dura mater, and the place being sought for from whence this matter had come, the bone was found, by means of the probe, to be perforated, opposite to the right eye. Therefore the external and internal passage of the whole wound was diligently sought after, and evidently found. That is to say, the instrument had pass'd betwixt the eye and the orbit, without injuring the eye, to the bony arch of the orbit; and after perforating this arch, had penetrated into the substance of the brain, so that the termination of the wound was distant only by the breadth of a finger, from the parietes of the left ventricle.

However, although it was winter, and the body was dissected soon after death, there was such a flaccidity of the viscera and vessels, that they did not bear even to be touch'd without having their texture injur'd; and, at the same time, such a putrid smell in the whole body, that Valsalva affirms he had never met with the like till that time; and ascribes the whole of it to the deprav'd disposition of fluids, which must have preceded the wound.

58. Of all the observations that I remember to have read, of the brain being injur'd through a wound of the orbit, scarcely any seems more surprising than this, when I consider what pass'd betwixt the wound and the

death of the man. For although others, of whom Horstius (*z*), Ballonius (*a*), Fantonus, the father (*b*), and Jo. Phil. Burggraffius (*c*), have written, did not die till the ninth, the eleventh, the fourteenth, or the twenty-first day; and others, of whom Peter Borelli (*d*), and Schmidius (*e*), have spoken, suspecting no danger, or making merry with their companions on that day, walk'd the length of two leagues, or of a quarter of a mile; yet the latter were either found dead on the day following, or fell down dead soon after; but the others, being either troubled first with a pain of the head, and after that with more violent symptoms, or being afflicted with these symptoms immediately after the accident, dragg'd through all that number of days under the painfulness thereof.

With neither of these have I class'd some others; as him whom Sennertus has describ'd (*f*), that immediately became apoplectic, and died about the ninth hour from thence; because that sharp sword seems to have entered the cavity of the cranium, through the *foramen nervi optici*; or, if you please, through the other neighbouring foramen, which is call'd *lacerum*: and that this might happen in the observation of Diemerbroeck (*g*), which I have look'd for here in the *Sepulchretum* in vain, you will not deny; the patient being depriv'd "of none of the animal actions" till the tenth day, and being then carried off, in the space of two days, by a "very violent fever" which superven'd.

But the musket-ball, which was "driven through the orbit of the right eye, in such a manner that it emerg'd from the left part of the occiput;" as the celebrated Helwich (*b*) has describ'd; does not seem to have been able to pass through without a fracture of the orbit; so that if you would refer this case to the class of those that I have taken notice of in the second place, you are at liberty to do so for me, especially as the woman fell down dead from the wound.

Yet I do not know to which class those belong, that have been said to be kill'd from a wound of the orbit, by Bohn (*i*), by Ruysch (*k*), Jacotius (*l*), and even Dodonæus (*m*), whose name being overlook'd, while this observation was copied into the *Sepulchretum* from Schenck (*n*), is improperly taken from the preceding. And I am ignorant, because it is by no means certain, from the narration of those authors, as it is from others, and particularly from Valsalva, how many days the wounded pass'd without the appearance of any bad symptom; as, for instance, a sleep, which Dodonæus mentions indeed, but does not say on what day it began: Bohn has only this, that the patient died on the third day after the blow: and Ruysch says nothing else, but that, in a short time after the wound was receiv'd, which, to those who had the care of it, seem'd of very small moment, death had come on. And

(*z*) *Sepulchr.* l. 1. S. 3. Obs. 38.

(*a*) *Ibid.* l. 4. S. hac 3. Obs. 17. §. 1.

(*b*) *Secl. ead.* Obs. 5. §. 10.

(*c*) *Act. N. C. Tom.* 6. Obs. 130.

(*d*) *Sepulchr.* Obs. cit. 17. §. 2.

(*e*) *Ibid.* in *Addit. ad hanc Secl.* Obs. 9.

(*f*) *Obs. cit.* 17. §. 4.

(*g*) *Anat.* l. 3. c. 10.

(*b*) *Eph. N. C. Dec.* 3. A. 9. & 10. Obs. 120.

(*i*) *De Renunc. Vuln. Secl.* 2. c. 1.

(*k*) *Obs. Anat. Chir.* 54.

(*l*) *Sepulchr.* Obs. cit. 17. §. 5.

(*m*) *Medic. Obs.* c. 3.

(*n*) *Obs. Medic.* l. 1. ubi de *Vuln. Cerebri.*

this author, although other observations of the same kind were already extant, as you might perceive, thought this of his so extraordinary, that he reckon'd in the number of those things, which Bidloo suppos'd could never happen, "a fatal wound of the orbit (*o*)."

Yet this observation ought not to have been omitted among the others which are added to the Sepulchretum; nor yet what Ruysch has added to it; I mean, that the superior part of the orbit is so thin and fragile, as, in many places, not to exceed the thickness of writing-paper, and to admit of a fracture from the finger alone: and, therefore, that wounds inflicted on the orbits are not to be made slight of, (as happen'd in many of them which I have taken notice of) especially if they are inflicted with a sword, or some instrument of a similar nature, or with a piece of wood that is not blunt-pointed, or if the wounded persons are seiz'd with a sleepiness, a nausea, a fever, a vertigo, or a convulsion; to which you may add, from the histories I have pointed out, a considerable pain of the head, a numbness of the limbs, a palsy, a delirium, or any other symptom of that kind.

And as this attention is sometimes of use towards the cure, for instance, by leading us to apply the trepan to the os frontis in proper time, which another observation of Borelli shews (*p*), so it is, for the most part at least, useful in making a prognosis. I have said for the most part: since although the others died, yet this patient of Borelli's escaped, and the celebrated Fantonus, in the scholium to his father's observation (*q*), which does not indeed particularly make mention of a wound of the corpus striatum, but appears to be the same that is refer'd to above from the Sepulchretum (*r*): says, that he knew a soldier, who, being wounded with a very sharp sword, at the internal angle of the orbit, and having fallen into a hemiplegia and weakness of the eye, drag'd on his life for many years in this state of health.

To this, I suppose, you will add that hunter, of whom Elias Camerarius (*s*) speaks, who being wounded, with a sharp instrument, in the same angle, and in the confines of the upper eye-lid, had a paralysis of the whole opposite side succeed to that wound, an amaurosis of the neighbouring eye, and a considerable diminution of memory; the paralysis, nevertheless, being by degrees very much alleviated afterwards, and he continuing to live, so that four months had already pass'd since the infliction of the wound, when the observation was written, and almost nine, as it seems, when it was sent to Augsburg.

Another young man, who is describ'd by Nebelius (*t*), was happier than he; for being wounded thorough the left orbit, and immediately seiz'd with a paralysis of the same side, and convulsive motions on the opposite side, with an aphonia, and soon after with a delirium and loss of memory, had, after the third week, a little sanies discharg'd from the right ear, after a great pain of that part having preceded; which discharge continu'd some days, and about six weeks after receiving the wound, he recover'd his health entirely. But lest you should happen to be surpriz'd that the hemiplegia had seiz'd on the side which lay under the wound, and that convulsions seiz'd on

(*o*) Resp. ad Bibl. Vindic.

(*p*) in Schol. ad cit. § 2. Obf. 17.

(*q*) 35.

(*r*) §. 10. Obf. 5.

(*s*) Eph. N. C. Cent. 3. Obf. 55.

(*t*) Earund. Cent. 6. Obf. 54.

the opposite side, contrary to what more generally happens, as I have said above (u); it is necessary you should be inform'd, that the wound had been inflicted with a sharp sword, which "had gone through the lower eye-lid, " under the external canthus of the left eye, and had proceeded upwards " in such a manner, that the point of the sword penetrated obliquely under " the bulb of that eye, through its bony orbit, towards the anterior basis " of the brain."

Add therefore with me, what this oblique passage of the sword, and the great pain of the right ear, and the salutary defluxion of sanies through the same ear, sufficiently show; I mean, that the sword penetrated through the anterior basis "of the right hemisphere" of the brain. By this means you will readily perceive that the left side of the body, and not the right, was opposite to the injury of the brain. And you naturally conceive of yourself, that not only wounds inflicted on the orbits, but even below the orbits, as the history of Egermeierus (x) had shown, and this other of our Valsalva's confirms, relate sometimes to the brain.

59. A young man, of twenty years of age, was wounded with the point of a sharp sword, about the lower margin of the orbit of the left eye. On being wounded he fell down: all the functions of the internal senses ceas'd: he became speechless. If you except certain convulsive motions, he scarcely gave any sign of motion; nevertheless he show'd some sense of pain, when the probe was introduc'd into the wound. The motion of respiration was encreas'd every hour. At length the pulse failing, he died about ten hours after receiving the wound.

The brain being taken out from the cranium, and the probe being introduc'd into the external orifice of the wound, it was found that the sword had penetrated into the cavity of the cranium, almost by the side of the os spongiosum superius; which was confirm'd by the bony fragments in that cavity, and by the substance of the cerebrum being wounded in that part. But how far the wound proceeded in the cerebrum, it was in vain to enquire with the probe, as, by reason of the softness of the substance of the brain, it might as easily make new passages, as show one that was already made. Taking away the dura mater therefore, and observing the pia, which, in the sinciput, was turgid with blood, like an inflam'd part; and the lateral ventricles being then open'd, in both of them was seen coagulated blood, which had flow'd out from the vessels that had, without doubt, been ruptur'd by the wound itself. And from these ventricles it seem'd to have overflow'd into the fourth; for in this cavity also a blood of this kind occur'd.

60. Thus I have given you the observations of Valsalva, which are greatly to be commended, even on this very account, that, in all of them in general, the days and the hours are mark'd down, on which the patients were attack'd with the particular symptoms, or with death: circumstances which, although very useful and necessary to be known by physicians and surgeons, are nevertheless wanting in most observations of the kind. As to my observations they bear no proportion to his in number. However, as this letter is already sufficiently prolix, I shall refer you to the next for them. Farewel.

LETTER the FIFTY-SECOND

Finishes the Discourse on Wounds and Blows of the Head.

1. **I**N giving you the remaining histories, which relate to the wounds and blows of the head, in this letter, I shall preserve the same order as in the former, and begin with those wherein either the injury of the cranium was very inconsiderable, or there was none at all. For although Celsus (*a*) says, "it rarely happens for the whole bony compages of the cranium to remain entire, and for some vein in the membrane of the brain to be ruptur'd internally from the blow;" yet the frequent dissection of bodies has since shown us, that something of this kind, or even a more violent injury, very frequently happens without any injury of the bone. And this I have not only heard Valsalva assert, from the testimony of his own dissections, but you yourself might also have learn'd from those that are describ'd among the first of the preceding letter. To which you may add, besides so many others that you will find in turning over the Sepulchretum, these also that I shall immediately subjoin.

2. A woman, of fifty years of age, and the mother of many children, being somewhat fatter than country-women (in the number of whom she was) for the most part are, fell into a ditch, and dash'd one side of the scapula against a very hard piece of ice; for it was the middle of the month of December, in the year 1725. The bone which receiv'd the blow was laid bare by this stroke, for two or three inches. On account of this wound she came into the hospital here: in which, without any paralysis, without any convulsion, without any very violent symptom preceding; for she had but just felt a slight inclination to vomit; without being weaken'd in her muscular strength, or that of her pulse, the wound suddenly grew dry and livid, and the day after, which was the eleventh from her fall, she died.

Her body, though the season was extremely cold, and though I dissected it not more than twenty-four hours after death, smelt so strong, that I was oblig'd to finish the dissection within the course of one day. Yet I remark'd many things that related both to a natural and to a diseas'd state. I shall, however, only give you the narration of the latter. In the belly the omentum was contracted, and the stomach was inclin'd obliquely too much to the right side. That part of the intestine colon, which lies under the sto-

(a) De Medic. l. 8. c. 4.

mach, did not proceed transversely, but was curv'd downwards; and the same intestine was very much dilated, from the beginning quite to this curvature, and livid. The spleen was longer than it naturally is. The testes were not only white, hard, and unequal, but in one of them lay hid, in the centre, a little body of a white colour, roundish, almost hollow, and cartilaginous. Both the tubes were utterly impervious at two fingers breadths below the larger orifice. The vagina was internally of a black colour, and at the lower and almost anterior part appear'd to be eroded, as if from an acrid humour; an erosion of which kind was also observ'd in one side of the cervix uteri.

In the thorax the lungs were black on the back-part. The heart was lax, and in its ventricles were many polypous concretions. The vessels were fill'd with a great quantity of blood, as they were in other parts of the body likewise.

Finally, in the head the os sincipitis was internally and externally livid, where it had been dash'd against the ice; yet had not the least fissure. The meninges, under which not pus or blood was extravasated, but water, were themselves also livid and greenish, in the part where they corresponded to the livid bone. So in that place only the cerebrum also was affected with a lividness, which did not however descend deeper than to the extent of two inches. The putrid odour which exhal'd from these parts was much more violent than that of the others, though those were exceedingly offensive, as I have already said.

3. The head of a man who had, in like manner, fall'n from a high place, was brought to me in the year 1722. Though the scull was neither fractur'd nor fissur'd, yet was there almost the same state of the meninges, and of the brain itself also.

4. A poor woman, of a habit of body inclining to fatness, having become mad through grief for having lost her husband, she herself being at that time very young, wander'd through the city in such a manner as to hurt nobody, but to be herself troubled with the reproaches and injurious treatment of the rabble. Wherefore, besides that she was said to have brought forth a child some months before, she was at last struck on the head by a profligate young fellow, with an iron pin or bolt, so that she died about the tenth or eleventh day after the blow, not without symptoms of a concussion in the brain.

The body being brought into the college the following day, that I might therefrom finish the anatomical demonstrations of the year 1728, before the end of February, it was scarcely possible to make use of it. For although it seem'd to be a very proper subject, when I order'd the intestines to be taken out; yet on the following day the greater part of the abdominal viscera were already green. I nevertheless observ'd the following things. The whole fundus uteri was very thick: the testes were very much enlarg'd, and rounder than usual in their figures: and the orifice of the tube was perfectly grown into one substance with the testis on one side. But the testes themselves, when dissected, shew'd nothing peculiar in their appearance, except that they contain'd a little more fluid than usual.

In both the cavities of the thorax was water contain'd. The posterior surface of the heart had already begun to be green.

But

But the head was in a more distemper'd state than any of the other parts, as was naturally to be expected. For although the cranium was sound, yet pus was contain'd betwixt that and the dura mater, and this membrane was moreover affected with a kind of sphacelus.

5. That the bodies of wounded persons very often become foetid, green, and putrid, soon after death, is not to be wonder'd at, when the part which was wounded already began to abound with pus and sanies, and still more when it was seiz'd with a gangrene, as was the case here. For the deprav'd and corrupted particles enter the blood through the ruptur'd venous or lymphatic vessels, and, with this fluid, are carried through the whole body. And that this takes place in wounds of the head also, I have seen more than once, especially in an old woman, whom I have taken notice of when I was writing to you on the subject of barrenness (*b*). For in that season which was so very cold, when the viscera of the belly were taken out, the septum transversum itself was soon after of a green colour.

But these things happen more readily in the carcases of those who, either in other parts, as in the aorta of that old woman, or in the humours themselves only, were dispos'd to putrefaction before the wound was receiv'd. And in the number of these, besides a man who was wounded in the orbit of the eye, of whom I wrote in the preceding letter (*c*), you will recount that country-woman, whose dissection I related to you just now (*d*); for an injury of that kind in the head did not sufficiently account for so great a state of putrefaction: although why this may sometimes seem to be, in part, less than it was before, may not only be gather'd from what has been just now said, but will be more clearly pointed out below (*e*).

6. A woman of the same age, but many years before, that is in the year 1706, had two wounds inflicted upon her head with a short and cutting instrument, which however was not very heavy; with one of these wounds that part of the right temporal muscle was injur'd, which lies behind the angular apophysis of the zygomatic bone, to use the words of the celebrated Winslow; the other was somewhat lower. Yet both the wounds were brought almost to a cicatrix, when the woman, exposing herself to the injuries of the cold air, and agitating the temporal muscle by the mastication of hard food, swell'd very much, soon after, in her whole face, and was shaken with rigors, and convulsive motions in her head: she was now and then also seiz'd with a slight delirium, till having a stertor come upon her, she died in the hospital of St. Mary de Morte at Bologna.

As I dissected not only her head on the following day, which was the twenty-sixth of March; but the other part of this woman also, I first observ'd the following appearances in the genitals, that were preternatural. In one of the testes was a small cyst of a yellow colour, inclining to green, wherein was a globule, as if of concremented blood, which had I know not what of a bright red appearance in the center. The uterus had its parietes much thicken'd, the internal coat being lax, under which were seen through its substance, in some places, bloody drops, perhaps because the menstrual flux had been coming on: or, probably, rather because the uterus was diseas'd. For a

(*b*) Epist 46, n. 26.

(*c*) n. 57.

(*d*) n. 2.

(*e*) n. 9.

white and pretty fluid matter occur'd betwixt the valves of the cervix, as if the woman had labour'd under a uterine fluor: and, indeed, the *osculum uteri* was more lax than the subjected vagina and its orifice requir'd, and, at the same time, somewhat injur'd on its surface, as if from acrid matter.

The skull being open'd, we found the dura mater to be thicken'd and red here and there, as if from drops of blood, which, however, you could not wipe off; and this in more than one place, where it is subjected to the basis of the cerebrum; as, for instance, at the sides of the sella turcica, and under the glandula pituitaria itself, but no where more than under the right anterior lobe of the cerebrum. Under which, and at the external side of the same lobe also, betwixt both the meninges, was a pus of a yellowish colour inclining to cineritious. Yet the substance of the cerebrum, and the other parts that were within the cranium, were unhurt; although the sanguiferous vessels, which run through the pia mater, appear'd to be somewhat more turgid than usual; and under this membrane was a small quantity of water, as there was a small quantity also, and of a reddish colour, in the lateral ventricles of the brain, and a polypous concretion in the superior sinus of the falx.

As we diligently enquir'd after the passage by which pus could enter the cranium from the wound, we found that all the bones which compos'd this cavity were quite free from injury on their internal surface. And then we pass'd on to examine the external parts. Under the upper wound; for the inferior, being less deep, had a different direction; there was a cavity about which, and in which, pus stagnated: and through this cavity a certain surgeon said that he introduc'd a probe into the cavity of the cranium, while the woman was living. And, indeed, there was a passage through the bone, perforated by the wound, for the pus to be carried from this cavity, not into the cranium however, but into the orbit of the eye: and by this slight difference the surgeon had been deceiv'd. But by what passage it was carried from the orbit, where pus was also found, into the cranium, there was not the least testimony to evince; whether we inspected the natural foramina, or examin'd into those which had happen'd to be open'd by the force of disease; especially as the dura mater was seen to be no-where eroded. And that animadversion had this use also; I mean, to prevent us from supposing that pus had pass'd through a certain very small chink which, we, at length, thought we discover'd, after raising up the arch of the orbit, by driving the chissel thereinto.

7. However, in researches of this kind, whether they are made in the living or in the dead body, as it is necessary to take care in the former, lest, where two natural cavities are disjoin'd by a thin septum, we too hastily suppose, that the probe which reaches into one has enter'd into the other; so it is proper, in the latter, to abstain from the use of the mallet and chissel, lest, if any chink should happen to appear, there may be a doubt whether it should be ascrib'd to our violence, or to the blow that had been receiv'd: as there certainly was no fissure, from either cause, in him whom I dissected a few days after in the same place.

8. There was an old man of a lusty habit of body, and of a yellow colour of skin, who had been before under medical courses, as an asthmatic patient.

This

This man having fall'n from on high, and dash'd the right side of his head against a stone; the cure of the wound which he had got by the fall, seem'd to go on very well, when, about the eleventh day, a difficulty of breathing came on, with a stertor. He had no pain in the thorax. But rather complain'd continually of a kind of troublesome sensation below the right hypochondrium. And applying our hands to this place, we perceiv'd a bubble, as it were, like one of those which the rain excites on the surface of water; and this rais'd itself up and subsided alternately and instantly, soon after returning and going away, and always keeping the same situation.

In the mean while, the head seem'd to be very well; but the man could not sleep, and convulsive startings of the tendons occur'd at the wrists to those who felt the pulse. And this, which had always been frequent, was now also become small. Wherefore, within a day or two after the difficulty of respiration came on, death freed the patient from his disorders.

The abdomen of the carcase was distended: and when this cavity was open'd, the stomach and the intestines appear'd to be distended with air, the small intestines being inflam'd in a certain place, and not without some fœtor. The liver was somewhat hard. The spleen was so lax, that it could be torn to pieces very easily by the fingers. The herniæ, and the lacerated flap, as it were, which hung from the ring of the pylorus, in consequence of their being sufficiently describ'd already (*f*), and the eleven ribs on each side also, which I have taken notice of in the *Adversaria* (*g*), I pass by here, as it is sufficient to hint that this is the man in whom these appearances were found. And as to the lower part of one of the lobes of the thyroid gland containing a pretty large globular body, and two others, in like manner, that were full of a ropy humour; I pass over these circumstances for this reason, because I have often taken notice of things of that kind in other bodies.

It will not be improper to add what appear'd in the thorax. The anterior surface of the lungs was connected by membranes to the chest. The lungs themselves were no-where hard; yet, although neither the legs nor the feet had been swell'd, both lobes were surrounded with a great quantity of water; the left with that which was of a red colour, and rather small in quantity; and the right with somewhat more, and that which was of a green and yellowish colour. On the right side, also, the pleura was putrid; so that it was not only very easy to separate it, but pieces thereof had been spontaneously separated, and swam in that water; and adhering to the membrane of the lungs, which was itself sound, belied the appearance of pus. The pericardium contain'd a reddish water; and the heart a frothy blood: the great artery, at its origin from the heart, had within it a polypous concretion.

The bone of the wounded sciniput lay open to the extent of half an inch, being of a livid colour, and comprehended in a kind of circular little furrow, as if the exterior lamina of the cranium had subsided. And the internal surface corresponding to it was of the same colour indeed, but comprehended in no little furrow. Nor, indeed, had the skull any other disorder besides, either there, or in any other part. But the dura mater, which lay under

(*f*) *Epist.* 43. n. 31. & *Epist.* 29. n. 17.

(*g*) II. *Animad.* 32. in fin.

that one place, was moist with a thickish ichor on its superior surface; and had adhering to its inferior surface, yet in such a manner that it could be taken away without any difficulty, a piece of another dura mater, as it were, which, when attentively examin'd, was found to be very similar to those spurious membranes wherewith the lungs and the pleura are frequently cover'd over, in inflammations of the thorax. Under this piece adher'd to the pia mater a kind of pretty large drop of thick and whitish ichor. And betwixt this membrane and the brain, not there only, but in several places, a small quantity of water was interpos'd. And this water was not wanting in the lateral ventricles, in which cavities it was of a reddish colour. However, all the substance of the cerebrum was every-where found: the cerebellum was very soft. And, finally, all the muscles of the body were flaccid.

9. As to the sensation of bubbles, as it were, rising up and subsiding, which was troublesome, indeed, but easily to be referr'd to flatulent habits, in which one certain part of the intestines is rais'd up, and not any other; if you, in concert with me, omit this symptom, and consider the others, you will, without doubt, add this observation also to the four which are already describ'd, and to many others given, from Valsalva, in the preceding letter; from which it is understood, that, although the bone is not perforated by any fissure, some part may be injur'd within the cranium by the force of the percussion: and of this injury death may be the consequence.

For as to the preternatural appearances which were found in the thorax of this old man, perhaps, they also add their origin or increase from those that were within the skull; some part of the deprav'd ichor being carried from thence into the thorax, especially as the man was subject to an asthma. And I even remember, that a woman who died of a blow on the forehead, had, contrary to expectation, a dirty-colour'd water in both cavities of the thorax: the history of which woman I shall send to you hereafter, among those that relate to the subject of lameness (*b*).

This suspicion has a colour given to it by the circumstance which I have remark'd in the observation of Valsalva, and others, about the translation of deprav'd matter from an injur'd cranium into the thorax, which is by no means rare (*i*). And although we know that where the question is of the meninges and brain, we are wont to attend no less to the acrimony, than to the quantity, of the injurious humour; yet it is not quite incongruous to suspect, or at least sometimes, that where a very little quantity of this is found within the skull of dead bodies, it is the remainder of a somewhat larger quantity, which, after having injur'd those parts, even more than is apparent, has been presently carried through the vessels into other parts, or dispers'd through the whole body; from whence we have also accounted for, in part, the signs of universal putrefaction, and the very putrid odour in particular (*k*). And how little mortal ichor, or disorder brought on by it, frequently remains within the cranium, or, at least, is found within the cranium, besides many histories of Valsalva (*l*), and the two first of ours, and this last, these others, which our very diligent Mediavia communicated to me, will show you.

(*b*) Epist. 56. n. 26.

(*k*) Supra, n 5.

(*i*) Epist. præced. 51. n. 17. & seqq.

(*l*) Epist. præced.

10. An old man was struck with a stone on one side of the *sinuiput*, when he was drunk, and had a wound inflicted thereby: yet he neither fell down, nor vomited, in consequence thereof. The wound being dilated, some days after, by the surgeon, the bone beneath was found to be somewhat livid, not very far from the angle which is intercepted by the sagittal and lambdoid sutures; for which reason it was scrap'd with an instrument proper for that purpose. Nor was the physician wanting in making use of every thing which it is customary in these cases to make use of. But the wound was almost dry, and not of a good colour: a fever attended it: the pulse was weak: the patient rose up out of bed in the night, complaining of the violence of the heat; and, indeed, it was the month of June, in the year 1739; but this seem'd to be done with some degree of delirium.

At length, the fever went away; the pulse became better; and now the patient declar'd that he could bear to abstain from food no longer. However, he was guilty of no irregularity, although the fever return'd after some days, with a sense of heaviness in the head, with a kind of torpor of the senses, a slight delirium, and a redness of the face and eyes. The physician, therefore, endeavour'd once more to alleviate the symptoms, but to no purpose; and in a short time after, the old man died; that is, about the twentieth day after receiving the blow.

The cranium was very thick; and the *dura mater* thick in proportion. In the former was no-where any mark of disorder; because, even in that part where it had been scrap'd, it was of a natural colour both internally and externally. The *dura mater* was likewise sound. But not so the *pia mater*, to the external surface of which, where it corresponded with the place of percussion, a little mucus adher'd; which was of a yellow colour inclining to green, and of a very filthy odour. That part of the *cerebrum* which lay beneath this mucus, began to become blackish, for as large a space as two fingers breadths would cover, in every direction; yet not to a greater depth than that of the cortical substance of the brain. However, the other parts were in a sound and proper state, except that a considerable quantity of reddish serum was found in the lateral ventricles, but more in that which lay under the wound. In both of these cavities the *plexus choroides* were of a pale colour.

11. A woman, who had been for a long time subject to an epileptic disorder, receiv'd a blow upon her head. In the beginning there was no symptom worth attention; so that, if she were ask'd about her complaints, she answer'd that they were all very slight, or none at all. But at the end of some days, the symptoms began to show themselves, and to increase; the fever was augmented; and a certain state of inactivity, which was very much like a constant sleep, came on, though without sleep; for if you attended to it, you heard her murmuring with a low and small voice. And in this manner, neither the first remedies, nor the latter, being of any advantage, she died.

The skull not only show'd no fissure, but had scarcely any change of colour, in the part where the blow had been receiv'd. Only under that place was a purulent mucus, as we have said in the old man, though in a rather larger quantity. Besides, from the internal surface of the cranium, where

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it hung over the falciform sinus, stood forth a bony prominence, which was small indeed, and short; but of such a kind, that if you drew your finger over from the posterior part forwards, your finger was prick'd thereby. But this probably related to the epilepsy; to the blow it certainly did not relate.

12. And Mediavia related that, in the same year 1739, it had happen'd, almost in the same manner, to some as to the old man, to others as to the woman, from blows of the head; and he had observ'd, if at any time the violent symptoms of disorder which had been in the beginning, were almost obliterated, and after that the fever, from a slight one, suddenly became violent, beginning with a coldness and perturbation of mind; if this came on in the eleventh day, that death follow'd on the fourteenth; but if the exacerbation of fever came on in the fourteenth day, that death came on in the seventeenth.

In reading these observations, and still more in reading the great number left us by Valsalva (*m*), I do not doubt but you are, and have been, much surpriz'd that no mention is made of the cranium being perforated by the trepan; especially in those cities wherein very eminent professors of the chirurgical art have flourish'd, who were accusom'd formerly, as we learn even from their writings, to afford this assistance with the greatest readiness to those who were wounded in the head.

Yet you will cease to wonder, when you consider the different fortune of so many remedies in different ages, and not only in different nations and climates, but in the same; and especially those remedies which are of a cruel nature, and at the same time of an uncertain event, as this is. The surgeons did not want readiness, dexterity, or courage: but courage was rather wanting to the patients, or their relations, or others who were concern'd; as they consider'd, on one hand, an operation which was cruel in its appearance, and, on the other, the event, which was often so unhappy, that to the common-people, and persons ignorant of the medical art, those patients who died might seem to have been kill'd by the method which was us'd in order to save them: which consideration, I suppose, led them to withhold their consent from the operation. And so many, so various, and so difficult to conjecture, are the causes for which the perforation of the cranium, although skilfully and innocently perform'd, may, nevertheless, become useless; that it might easily happen, among many who were trepann'd in those years, that very few only escap'd.

Nor would I have you wonder, that I said it might so happen, since Tronius testifies, in the work of Bohn (*n*), that in the hospital of a large city in Italy, all who were wounded in the head, and underwent the operation of trepanning, actually "perished," not one excepted. And what will you say to this? that in a hospital, in a foreign nation, which is much larger, not before the end of the sixteenth century, but in this our age, not under any rash operator, but under the most experienced surgeons, the same, or almost the same thing happens, as has been committed to writing;

(*m*) *Epist.* 51.

(*n*) *Dissert. de Trepanat. Difficult.*

and in neither place can we lay all the blame upon the air, although infected with unwholesome effluvia of a great number of sick persons; since it is certain, that, in both of them, wounds of the head, even when considerable, have been cur'd by being treated in a different method, and are still cur'd.

Take care how you suppose, that I here wish for greater diligence, or skill, in these very celebrated men. There are causes enough for us to accuse, as I had begun to say. Thus suppose, for instance, that blood is sometimes extravasated within the ventricles of the brain, or under the basis of it; at other times it may be extravasated externally indeed, and at the upper-part, but under the dura mater; or if above this, yet in a place directly opposite to which the surgeon dare not trepan; for instance, under the muscles of the temples, or opposite to the pituitary sinusses of the forehead.

Nor will you interrupt me by replying, that the cranium may sometimes be perforated, even opposite to the seat of these sinusses, and under those muscles; and the dura mater be cut into above that blood. For I know, that the frontal sinusses are wanting in some persons, which I think I have sometimes observ'd, where the lower part of the forehead was not at all prominent about the eye-brows, but flat. Nor does it escape me, that, in order to draw out the matter which is confin'd under that membrane, the incision thereof has been propos'd by the most excellent surgeons; among whom our country-men, Gabriel Falloppius (*o*), Cæsar Magatus (*p*), Peter de Marchettis (*q*), were not the last; nor that the temporal muscle has been "cut many times with success," by the same Magatus (*r*); nor that, before Magatus, five successful instances of the same muscle being cut, were, in like manner, publish'd by Carcanus (*s*); no convulsion being the consequence, even when the whole of it was cut through transversely: and I myself saw here, in the year 1734, a young man, who, having had a dagger forc'd through that muscle, from the upper and anterior part of it, quite into the concha of the external ear, behind the tragus, was troubled with a great hæmorrhage indeed, but with no fever, much less with any convulsion, and recover'd very happily.

I know then, that these things were propos'd, or done, by the Italians, others being even at that time afraid of them. But, at the same time, I know, that these things were done in consequence of the most extreme necessity, and not without very great danger, which they themselves do not dissemble, and particularly of convulsions, which not Hippocrates (*t*) only, but even Marchetti (*u*) himself, saw to be the consequence thereof; so that, for this very reason, he would not recommend the cutting of this muscle; not to say that he has expressly said, it ought "never" to be undertaken.

Whether, therefore, the surgeons, at that time in which the perforation of the cranium began to be not well spoken of in some cities, perform'd this operation in any very safe place, and as far as they suppos'd it to be

(*o*) Comm. in Hipp. de Vuln. Cap. c. 43.

(*p*) De rara Medic. Vuln. l. 2. c. 38.

(*q*) Syllog. Obs. Med. Chir. 14.

(*r*) l. 2. cit. c. 27.

(*s*) De Vuln. Cap. Serm. 1. Lect. 8.

(*t*) in Coac. juxta Dureti interpret. l. 3. tr.

2. c. 1. n. 1.

(*u*) Syllog. cit. in addit. ad Obs. 15.

proper, not daring to imitate the above-mention'd authors in the other proceedings, and the patients nevertheless perish'd; or whether they did dare to imitate them; and convulsions, suppose, or other evils following the imitation, the patients perish'd in so much a more miserable manner (for our enquiry is, not what necessarily happen'd, but what might happen, in order to make a remedy of this kind become deserted); you see into what fear the people might have been thrown, and how naturally their opinion might, from either of the events, become averse to the practice.

13. But besides those reasons that have been mention'd, it might happen for many others, that the perforation of the cranium, at that time, might be perform'd without any utility, and even not without manifest detriment; which is a circumstance that would render the minds of the people still more averse to the remedy in question: as, for instance, if a surgeon, who happen'd to be ignorant how often dents or cavities are impress'd upon the internal surface of the cranium, which cavities I have already spoken of to you (*x*), and which sometimes receive so very deeply the tubercles, as they formerly call'd them, of the dura mater, that you will have only one, and that a very thin external lamina of the bone, remaining, especially in the ossa sincipitis, and sometimes in the os frontis; through the ignorance of which circumstances, I fear, lest some observers have consider'd them as disorders of the cranium, and dura mater; if he then, I say, had by chance borne down the trepan against any one of these cavities, for they have no certain situations, he would, without doubt, first have injur'd the dura mater, and the parts whereby it is rais'd up, before he could have suppos'd the whole of the first lamina to have been pierc'd through by him: or if another, having laid bare the same membrane by the trepan, and supposing pus to be confin'd under it, (for there sometimes is pus, as we learn from many observations, and among these, from two that are publish'd by Murray (*y*), and confirm'd by anatomy) had cut into it; but being deceiv'd by the signs (amongst which, whether "the most certain of all can be the "cessation of the pulsatile motion, impress'd thereon by the arteries of "the cerebrum," others must determine), had carried the point of the instrument not against the pus, which did not exist at all, but against the pia mater and the brain; or if not deceiv'd, had wounded the branches of the artery that creep through the dura mater.

I omit to enumerate other errors, many of which might happen in an operation that is not very easy and clear, and that to the great detriment of the patients: and I return to the remaining causes which might render this operation useless.

To take notice of some of these only; at least though the blood was extravasated betwixt the dura mater and the cranium, and in those places even which nothing forbids us to perforate; yet if, being coagulated, it had adher'd so closely and tenaciously to that membrane, as not to be separated therefrom without violence, as it has happen'd to many others, and to Valsalva himself, more than once, to find it; for we particularly refer to nothing, as you may even have observ'd above, but you have examples of almost every circum-

stance in the preceding or in the present letter; of what advantage would it have been to perforate the cranium?

You will perhaps say: But if it had adher'd in this manner, even before death, a skilful surgeon would have been able to apply such things as might dissolve, and set it loose. Let us suppose it. Yet what if some part of the coagulated blood lay in such a place as the infus'd fluid could have no access to; for you are not ignorant that this membrane adheres very closely to the cranium; and that it follows from hence, that one place, wherein it is separated from the cranium, cannot communicate with another, though very near, in which it is likewise separated, or at least so expeditiously, as would be necessary for it both to enter and to be discharg'd.

Nor am I ignorant by what instruments surgeons can separate some neighbouring part of the dura mater from the scull; and that the patient, by holding his breath at intervals, may urge the cohering matter, and procure it a more easy discharge from its recesses.

But, on the other hand, I also see the danger, lest, by tearing away the dura mater, the surgeon should hurt this membrane; or lest some vessel of these pretty large ones which I have before mention'd, should be injur'd thereby; as you know very well that they are prominent through the external surface of this membrane, and are receiv'd within those ramifying furrows of the scull: and indeed I am not without fear of those exertions in the patient, if he can really hear, and do what is commanded him, and does not lie in an apoplectic state, without sense or motion.

For when respiration is restrain'd, and men exert themselves in this state, it is evident that a greater quantity of blood is retain'd in the head, even by observing their faces, which are at that time tumid and red; either because the return of the blood is then less easy on all sides, in consequence of the lungs being at rest, or even for that reason which Santorini (z) suppos'd, or for some other cause of that kind peculiar to the head. Wherefore the vessels of the brain being turgid, the pia mater is every where forc'd against the dura; and if there happens to be any fluid betwixt this and the cranium, that is squeez'd out through the foramen which is open'd in the cranium, where there is the least resistance, if the progress of it this way be not wholly obstructed. But even the distension of the vessels, in general, may give rise to a fresh eruption of blood through the injur'd vessels; and the too violent and too frequently-repeated compression of the dura mater, may occasion an inflammation therein. And you see that neither of these circumstances can contribute much to the recovery of the patient.

Besides, there is sometimes blood in a fluxile state, so that it might escape at this foramen; but it is in such a quantity, that before it can be taken out, it must have press'd upon the brain, in such a manner as to kill the patient; an example almost similar to which you have in one of our *Epistolæ Anatomicæ* (a). Add to this, that it might already have brought, by its corruption, a fatal disorder upon the meninges.

Moreover, suppose every thing that I have said of blood to be said of pus also, or, if you please, of sanies and ichor.

(z) Obs. Anat. c. 3. in fin.

(a) XIII. n. 16.

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And what if there be none of these circumstances, but the concussion of the cerebrum is so great as to have considerably destroy'd its internal structure? Read over again, I beg of you, the observation taken from the man who died of a violent blow on his head, which I have describ'd to you in the eighth letter (*b*), and compare it with that of the criminal which I then took notice of from Littre (*c*), and to which, when spoken of in the preceding letter (*d*), we added another of Hænelius. In none of those three was blood extravasated; yet the two first died immediately after the blow receiv'd, and the third within twelve hours. Suppose that any one of them, in consequence of the concussion being somewhat less, could have liv'd some little time, and that the cranium had been perforated, as if the brain were compress'd from an internal extravasation of blood; could the blood have been discharg'd which never was extravasated?

And to this supposition relate those words of Ballonius (*e*): " Sometimes the brain suffers an internal concussion when the cranium is unhurt, and the flesh only slightly contus'd:" and a little lower, " It has been observ'd, by experience, that innumerable persons have died of disorders of the brain, after convulsions and concussions; in the brain of whom nothing could be found, by means of dissection, that might seem to have been the cause of so terrible symptoms. And this has deceiv'd most persons, who have suppos'd that they could find something worthy of attention in the brain of those who died, after having labour'd under these disorders. So occult frequently is the cause of convulsion." There is, on the other hand, when there is a great and conspicuous injury in the brain, or a great quantity of blood extravasated within the cranium: and yet when this is perforated, none can be drawn out from the brain, or the blood is discharg'd to no purpose.

See an instance of the first case, in the observation of Elias Camerarius (*f*), who relates that the cranium was perforated in vain for this reason, that a suppuration, which had follow'd the blow of the head, lay hid within the brain, which was every where found and entire externally. And examples of the second case you may draw from the observations of those who have found the sanguiferous vessels, and the arteries in particular, ruptur'd within the skull after concussion. It is sufficient for you to turn to Bohn (*g*), who saw it three times. Suppose that the arteries either were not in the number of the largest, or were not altogether ruptur'd; for in this case there would not be time to apply the trepan. Yet of what effect would it be to perforate the cranium, in order to draw out the extravasated blood, if still fresh and fresh extravasations were made, and added to the first, by the arteries, though of the smaller size, which were not altogether ruptur'd? I omit other causes, even those which are not to be imputed so much to the carelessness and errors of the surgeons, as of the patients and those who are about them, which are not always known to the common people; and I go on to that from which I suppose it has more frequently happen'd, than from others, that the perforation of the cranium might, to the populace, seem of no effect.

(*b*) n. 15.
(*a*) n. 10.

(*c*) n. 18.
(*e*) l. de Convulsione.

(*f*) Aët. N. C. Tom. 2. Obs. 149.
(*g*) De Renunc. Vuln. S. 2. c. 1.

14. For although there are signs from which we may suspect that blood is effus'd within the scull; who can, for a certainty, say, whether there is really such an extravasation; and if he knew this, how could he know in what part the extravasation was made, and consequently where the bone ought to be pierc'd through? It very often happens that nobody is present when a man falls from a considerable height, or when he is struck by an enemy; and he himself frequently cannot speak: and sometimes many places appear to have been struck, and sometimes none; and in those many places, when examin'd by the eyes and the hands, even after applying emollient plaisters and resolvent facculi, some redness, tumour, or softness, can but just be perceiv'd. And indeed Rouhault (*b*) has seen that a spontaneous tumour sometimes appears in the part of the head which had not been struck; and has even shown in what manner it might happen.

Nor are the other signs, which have been propos'd by the ancient or the modern physicians, of sufficient avail; as, for instance, if the patient who can neither speak nor understand, apply his hand now and then to a certain part of his head; or the physicians, by chance, observing one side of the body to be paralytic, conjecture the injury to have been in the opposite side of the head. For besides one place, which perhaps gives greater pain externally, there may be other places, under which the greater internal disorder may really lie hid; nor is it necessary that some paralysis should be always the consequence of this; or if it is the consequence, we do not, of course, know the part of the side which is principally diseas'd, because we know the affected side.

Yet this it would be necessary to know, in order to make the foramen, which is to be open'd, correspond to the diseas'd part; and to convince every one that this opening was not made in vain. But how deceitful our conjectures on this subject frequently are, appears even from hence, that although the very part which was struck be pointed out by the patient, and even evidently show itself by an ecchymosis and tumour; yet cases frequently happen, wherein one part is contus'd, and yet another has the extravasation made in it. And this you will understand, not only from some of the observations describ'd in the former letter, and others; but in particular from this which I shall immediately subjoin, and which, being communicated to me by our Mediavia, deserves the more to be transcrib'd here, because, in the case of which it gives the history, the cranium was perforated.

15. A robust country-lad, having fall'n from a high place, had hurt his head. Not the least bad symptom was observ'd to be the consequence, either then, or soon after, on the following days. He therefore continu'd, for the space of three days, to live as usual, and to follow the businesses of life in the country, according to custom. After this, an evident tumour appear'd in the place which had been hurt; which was about the part of one of the bones of the sinciput, that is nearest to the lambdoid suture; and a fever being added thereto, he was compell'd to come into the hospital.

Being plied by the physician and surgeon with every remedy their art could

(*b*) *Traité des playes de tête* ch. 10.

supply, he now seem'd to be almost recover'd; especially as, through the whole of that time, no peculiar symptom of a latent disorder had discover'd itself. About the seventeenth day from his fall, when he could bear hunger on longer, he was presumptuous enough to eat very plentifully. Presently the fever return'd in a more violent manner, with a pain which oppress'd the whole head, and a vomiting. Yet even then did he not confess his irregularity, which he had been guilty of privily to every body.

When other remedies had been tried in vain, mention was made of one which every body here refuses, but he himself did not at all fear. In the place, therefore, where it was certain that the head had receiv'd a blow, the bone, which show'd no disorder at all, was perforated by a bold and eminent surgeon, with such diligence and art, that the perforation could do no harm, if it were of no advantage. Nothing was discharg'd then, or afterwards. The dura mater appear'd to be very sound, and was preserv'd so. And in the mean while the patient seem'd to be a little better: nor did he any longer conceal the previous irregularity of his conduct; when, of a sudden, he was seiz'd with a pleurisy, at the lower and left part of the thorax; and no remedies being of service to him, he died within a few days, although he had even thrown up a kind of matter from his lungs, which was somewhat tinctur'd with blood, but not a great quantity; and no symptom of the head being affected had come on, besides those which I have already mention'd.

The carcase, from the mouth of which a filthy matter was discharg'd, was livid below the throat, on the left side only, and that to a small extent merely; but was so exceedingly putrid and ill-smelling, that even in this very cold season, for it was the beginning of January, in the year 1742, it could not be borne. No part therefore, except the cranium, which was very thick, was open'd. Yet in the cranium was found not the least mark of disease; nor yet in any of its contents, if you except a very little yellow kind of jelly, which was found to be extended, in every direction, under the dura mater, for the space of three or four inches; not under the contus'd part of the head, where the trepan had been applied, but more to the fore-part.

16. If you compare this history with those animadversions which I made above (i), you will readily suspect the cause from whence a pleurisy had arisen in this young man; and that the very small quantity of matter which was found under the dura mater, was the remains of some which had existed there in much larger quantity, the other part of it having been translated into the thorax in particular, and into the whole body in general; as the universal state of putrefaction show'd. And if this was the just idea of the case, it were to be wish'd, that before the matter could have been carried to these parts, it might have been extracted by a perforation of the cranium.

Yet who could possibly know that it was necessary to perforate the cranium, not under the contus'd part, but more anteriorly, where there was no peculiar mark of matter being collected? But even suppose this could have been divin'd; tell me, I beg of you, at what time the cranium should have

been perforated? Should it have been done before the seventeenth day? Yet there was no sign of any fluid being extravasated. Should it have been done as soon as any bad symptoms appear'd? Although the most experienc'd surgeon Carcanus (*k*) has expressly inculcated, "that when the bad symptoms appear," not in the first days, but "in process of time," when "they are wont to proceed from a corruption which is already made, or which is beginning to come on, we can very seldom have any hope of an infirm constitution; nay, that the fate of it is almost always determin'd;" yet they would not be backward to make use of this doubtful remedy, in the case of a patient, who, by way of a rare instance in this country, chose to undergo it; since Carcanus himself did not deny, that a person might be sav'd; and even did not conceal the testimony of Falloppius, who affirms, that one man was preserv'd by him, in consequence of the cranium being perforated, about the thirtieth or fortieth day, and the sanies being discharg'd therefrom; though Carcanus was not very forward to give credit to it, and would, certainly, with more difficulty have given his credit, if other rare, but not less certain, observations of this kind had been publish'd; and in particular, of Scultetus (*l*), who, "after the twenty-eighth week from the injury's being receiv'd," affirm'd, that he had done the same thing as Falloppius, naming the man, and pointing out the time and place wherein the case happen'd. In this young man, therefore, all that could be done, was done. But that cause, on account of which I have propos'd this history, prevented a happy success attending the endeavours that were made use of.

17. And I wish this were the only history of the kind, and that others, very similar to this, were not extant among different authors, which moreover, together with many others, that, for several reasons, likewise show the use of the trepan to be of no advantage, and that, very frequently, have induc'd eminent physicians, both ancient and modern, to assert not only that this operation was "often of no effect," but even that it was very frequently of no advantage.

The minds of practitioners, however, and of the people in general, have been much more terrified by those who formerly, and even in our times, have asserted, that there was "a considerable danger" therefrom; or that "the danger was more certain;" and that trepanning "could not be made use of without very great danger." Will you then ask, whether it could be dangerous, when made use of by an excellent surgeon? Without doubt, it is to be suppos'd, that the physicians who were sent for to Ptolemy, that king of Egypt who was "violently wounded on the head," and of whom mention is made in the epitome (*m*) of Titus Livy, were not wanting in eminence or skill. Yet the king "expir'd in the midst of the operation, while the physicians endeavour'd to pierce through the bones."

And who does not know how excellent a physician and surgeon Falloppius was? yet he, with such a simple confession of his error as is worthy of the greatest men, on account of a certain circumstance observ'd by him,

(*k*) De Vuln. Cap. Serm. 3. Lect. 5.

(*l*) Obs. 13.

(*m*). l. 52.

very late, in perforating the cranium, has said the following things (n): "Observe, I beseech you; I have been the occasion of death, in some measure, to a hundred men, being ignorant of this cause." And these several things that I have mention'd, neither could then, nor can now, be conceal'd: as they have been said in so many books of so many writers, of different ages and countries.

There is no occasion, therefore, to wonder that the people of this country began to refuse the assistance of this remedy, being deterr'd from it by experiments of its being useless in particular, or injurious; and this not only in one or two cities, but in most of the cities of Italy; and, besides our countrymen, by others also, amongst whom Wepfer (o) hints, that his countrymen were, at a time when the use of the trepan even flourish'd among us: his words are, "The Italians, and other inhabitants of the more warm regions, would have determin'd to make use of the trepan immediately; and the very experienc'd D. D. Burgouverus would have done the same thing, if the patient, and those who were about him, had not entertain'd a dreadful idea of a remedy which they were unus'd to in these places, and which is terrible to most persons, even by its name alone; and had not, in consequence thereof, resisted his endeavours."

And can you suppose, that courage was given to those persons, who refus'd to suffer this operation by the declaration of John Bohn, an eminent professor at Leipzig, in the dissertation which he publish'd, *de Trepanationis Difficultatibus*? For before he particularly explains these difficulties, he does not hesitate to affirm, "that this operation, certainly, is attended with much danger; and that it is often found of no effect, or improper." As I have taken notice of the greatest part of these difficulties sufficiently above; I shall rather add something of that one, which was taken from the last-produc'd observation; I mean, of that difficulty which very frequently occurs, in determining the time that is proper for applying the trepan. And this I have it in my power to confirm, by another example which was seen by me in this city.

There was a young woman, of no mean parentage, slender in her make, and of a weak constitution, but healthy, so as never to have had any disorder, but very severe convulsions; which she had been afflicted with some years before, in the whole of her body, though not more than once. Being, therefore, in good health, and sitting upon a very low seat, it accidentally happen'd, that being surpriz'd with an unforeseen thing, and a noise, she drew her head back hastily, as is frequently the case, and struck one side of the occiput, with violence, against a marble slab, which was prominent, behind her, from the wall. It was the last day but one of March, in the year 1739; nor did she feel any inconvenience then, nor for some days. After that, there was a little pain in the place which had receiv'd the blow; and to this succeeded, in the side of the neck below that part, a kind of rigidity of the muscles that lie there, attended with considerable pain. Yet all these symptoms were so slight, that the patient did all the same kinds of business

(n) Comment. supra ad n. 12. cit. c. 17.

(o) Historiar. Apopl. Auctar. in Schol. ad Hist. 6.

she had been us'd to do before, both at home and abroad. Who then would, at this time, have presum'd to order the cranium to be trepan'd? or if any could have been so presumptuous; do you think, that others would have permitted it, or that a delicate woman would have suffer'd it? Now take the remainder of the history.

The woman having gone on, quite to the month of August, in the manner I have told you, that is, having felt no other inconvenience, besides what has been taken notice of, I was sent for to her on the sixteenth day of the same month; having had, from her physician, the relation which I have given you: he farther added, that for some days past, the patient was feverish, and that to a considerable degree; that her pulse was hard; that those muscles of the neck were somewhat swell'd, rigid, and affected with pain; that there was a pain also which descended in the course of the spine, and that it was with difficulty the lower jaw could be drawn down from the upper: that the patient herself was almost stupid, and answered slowly; and indeed, that she was sometimes a little delirious: that she did not see very well; and that her eyes seem'd to be convuls'd as it were: but that these last symptoms were then gone off; yet that the others had now remain'd for several days.

He moreover told me, that the pain had, within these few days, return'd to the place which was formerly struck; although, to the judgment of the touch, and of the sight, no disorder appear'd in the part. On seeing the patient, soon after, I perceiv'd that what he had related was but too true, and that there was now no room for remedies. Having, therefore, propos'd some things of little importance, on which no calumny could fall, merely to comply with custom; I call'd aside one of the elder of her relations, and told him how much I apprehended from the patient's case: after which I took my leave, thinking it unnecessary to return any more. And, in fact, two or three hours after I was gone, her speech left her: and within two or three days she died.

If we had been permitted to examine the internal parts of the skull, I do not doubt, but as our Marchetti (*p*) found pus upon the membranes and brain, in a man, who, having been slightly wounded in the head, so that not even the bone was laid bare, was, after three months, seiz'd with a fever, and after that with a pain which return'd into the wounded part, where was no appearance of disease, and in this manner died; I do not doubt, I say, but I should have found it so much the more in this woman, as she had not, like that man, been without any symptom of a wound in the head, either in the fever, or before it; but had been already troubled with several symptoms, for four months and more before the fever, and with as many after the time of being attack'd with the fever.

Thus you very plainly perceive, that cases may happen, wherein either no symptoms of blood being extravasated in the cranium, offer themselves in the beginning, or they are very slight; but after a long interval, so many and so violent symptoms crowd upon and attack the patient, that

neither in the first part of the disease, which is convenient for trepanning, the patient can be struck with such a fear as to make him admit of that operation; nor in the latter part can the physicians hope to be of any use to the patient thereby; as you cannot suppose, after so long a space of time, and after the existence of so many destructive symptoms, that a corruption of the parts was not brought on, though it was absent, almost beyond belief, in that very rare observation of Scultetus (*q*).

18. But what, you will say, can make patients of this kind, or their relations, and others who are concern'd for them, so averse to this remedy, even at a time when violent symptoms are immediately present? Read over again all that has been said above (*r*) of the causes for which it is to be suppos'd that this remedy has been deserted in some cities, and to those also add that which is gather'd from the following history of Mediavia.

19. A boy, of fourteen years of age, was struck on one side of the sin-ciput with a pole, about the middle of August, in the year 1739. At the same time an old man had been struck on the head also. Both of them had fall'n down after the blow; both had vomited; and soon after been seiz'd with a fever. Both of them were receiv'd into the same hospital; and both of them attended to with equal diligence by the physician and surgeon. Thus far the cases were in every respect similar. But now I will tell you the dissimilar fate, of the boy first, and then of the old man. The fever having left the boy about the fourth day, attack'd him again on the eleventh, being always attended with a torpor, sometimes with a delirium, or convulsions, or an eruption of blood from the nostrils; though a sufficient quantity of this fluid had already been taken away in the beginning. No remedies, therefore, being of any advantage, he died within a very few days.

The cranium, when inspected by means of a bright and opposite light, was found not only not to be fissur'd, but scarcely to show any difference, when the part which had been struck was compar'd with the other part. But betwixt the part which had been struck and the dura mater, something similar to mucus occur'd, and under this mucus the dura mater was alter'd from its natural colour. But betwixt this membrane and the pia mater, where it invested almost the whole upper surface of that hemisphere, was a great quantity of pus of a yellow and green colour, and very foetid in its smell: and all that part of this membrane which had been cover'd with pus, was increas'd beyond its natural thickness in a triple or quadruple proportion; its surface being in a manner granulated. Besides this nothing was observ'd, not even in the ventricles, no water being found therein. Thus far of the boy. But as to the old man, he escap'd quite safe and sound.

20. Now, if you tell the common people, that this boy might certainly have escap'd, if the bone had been perforated, and the blood which was extravasated beneath had been extracted; without doubt, the people would immediately reply, But the old man, who had likewise been seiz'd with the same symptoms in the beginning, recover'd totally without that remedy. It is true, you would not want wherewith to rejoin to those who should argue in

this manner. But what are these reasonings to the people, who are always taking new arguments from all the cures which have happily succeeded without the use of the trepan in wounds of the head, to make themselves still more averse to it? And this does not, I suppose, happen among us only, but in other places likewise; for in others, examples of cures of this kind, also, frequently occur. What the symptoms are which show violent injuries to exist within the cranium, and such as would seem to require trepanning, you will learn from several books, and in particular from those which belong to the *Commercium Litterarium* (s).

Where you may look for other examples, appears not only from the *Acta Eruditorum Lipsiensia* (t), but from the dissertation of Jo. Andr. Conradus (u), and others, whom, for the sake of brevity, I purposely omit; as I also do the observation of Grimmus (x), and two of Burgouverus (y), one of which is that wherein he himself would have perforated the cranium, if the persons about the patient had not been against it; as that surgeon also would of whom Rouhault (z) makes mention, if Mery had not dissented. Yet all the patients that I have referr'd to were perfectly cur'd without the assistance of the trepan, and some of them even very soon.

But that you may the more clearly perceive with how much propriety I have said it happens, in cases of this kind, that persons are more and more averse to perforations by the trepan, I will tell you what happen'd here in the year 1729. The coachman of a noble matron not being able to keep his horses in with the reins, she threw herself out of the chariot, as it mov'd along with great velocity, and had the same thing happen to her that happens to others, in general, in the same case; that is, she fell headlong on the ground, which was, from the nature of the place, and the severe season of the year, cover'd with stones and very hard ice. She, therefore, hurt her head so grievously, that she was carried home for dead.

The physicians, having done all that ought to be done, and is customary to be done, with the utmost diligence, hop'd what Marchetti, as has been said in the former letter also (a), had seen in some persons after a fall, or an injury on the head from a blow, "that losing their internal senses, and "being depriv'd of feeling and motion," yet not being seiz'd with the other symptoms that are taken notice of by Hippocrates, they should, in the same manner, see the woman "entirely freed from her disorder on the following "day." But as in this hope they were disappointed, I was call'd to the patient.

From the appearance of her head we could not argue in what part, particularly, it had been struck; nor could her sensation, or voice, of which she was entirely bereft, make this known to us. I, therefore, gave it as my opinion, that, when the other things were done which contributed to re-

(s) Vid. A. 1739. Hebd. 52. n. 1. & A. 1741. H. 16. n. 3. & A. 1743. H. 35. n. 2. H. 47, n. 1. ad 194. & 193. & 714.
(t) A. 1693. M. Nov. in relat. novæ Edit. Barbett.

(u) De Vuln. Front. insliet. in Resolut ad Eph. N. C. Dec. 3. A. 9, & 10. Obs. 87-
(x) 6, & 7. in Auctar. supra ad n. 17 cit.
(y) Tr. supra ad n. 14. cit. c. 7.
(z) N. 10.

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vulsion and reabsorption, if it should happen that any blood was extravasated within the skull, to the whole of the head should be immediately applied such things as, by moderately attenuating and corroborating, might assist that absorption: that Cornelius Celsus (*b*) had ascrib'd a great deal to external remedies, even where the cranium was manifestly fissur'd: that what Galen had done afterwards, and many others formerly, may be understood from Magatus (*c*), who had also himself begun the cure in this manner.

What the authors more modern than Magatus thought, I had learn'd even from the reading of my anatomists with whom I was so frequently conversing; and particularly of Bartholin (*d*), Wepfer (*e*), and Ruysch (*f*). That we, indeed, were in Italy, a region much warmer than theirs; but that Magatus, to omit others, was in this region also: and that, at this time of the year, the cold was often more intense than in other times of the year among them; and that, therefore, our matron, like the woman spoken of by Ruysch, was hurt from this cause, that "she had fall'n from the chariot upon the ground when harden'd with the frost." That, therefore, I would make use of the same fomentation which he had frequently made use of with success, and not contrary to the cautious admonitions of Magatus, but having in it some of the ingredients that he had recommended.

The physicians came into this opinion: nor had they reason to repent it; as, by the continu'd use of this remedy, the patient first became a little better, and then came quite to herself; and, finally, so far recover'd, without any remaining inconvenience, that she liv'd more than twenty years in a good state of health, till she was at last carried off by mere old age.

But this instance of success made men still more averse to the perforation of the cranium, and caus'd the fomentation I have spoken of to be recommended from that very time both by the physicians and surgeons; but to be particularly desir'd by the patients and their relations, and to be in very frequent use here; and this to such a great degree, that I was sometimes afraid, lest, being improperly made use of, it should be as injurious to some persons as it had been profitable to others. For I have seen it applied in the hottest seasons that we have in this country, as it was in that case which the present recalls to my mind, and which I will mention to you in a few words, though not on account of this animadversion only, but on account of some others also.

21. A noble count, happening to sit on a pretty high bench, which gave way under him, fell backwards, and dash'd the hinder part of his head against the wall, with so much the more violence as it was bald, and he himself of a tall stature. He perceiv'd no disorder at that time, except that a great number of sparks seem'd to be flying about before his eyes. But afterwards he had a very troublesome pain about the forehead and the eyes, watchings, fever, and a flux of the intestines. The fever went off. Soon after it return'd with the same symptoms. I was call'd into consultation.

Some of the physicians were particularly displeas'd with the intestinal flux.

(b) De Medic. 1. 8. c. 4.

(c) L. 2. supra ad n. 12. cit. c. 38. 41. 49.

(d) Cent. 2. Hist. Anat. 41.

(e) Exerc. de loco aff. in Apopl. & in Auctar. Schol. ad Hist. 6.

(f) Obs. Anat. Chir. 60.

For they had read this in Marchetti (*g*): “ Besides the signs propos’d by Hippocrates, it is to be observ’d, that a flux of the belly coming on in wounds of the head, notwithstanding the absence of other symptoms, is a sign of the brain’s being injur’d: - - - and that almost all these persons die, on account of the brain being injur’d in the internal part, where it is stretch’d out into the medulla spinalis, and where is the origin of the nerves,” and among the others of those that go to the stomach. I, however, having enquir’d into all things accurately; and, as it was the month of July, in the year 1739, having found that a greater quantity of water might easily have been taken than the stomach of an old man would bear; for water had been prescrib’d as his common drink; spoke to the following effect:

I will omit to discuss this question here, whether Marchetti, when he said that the other symptoms were absent, meant also to except those which he says were propos’d by Hippocrates, and which certainly are absent in this case. I will only say this, if the patient had fall’n down at a time when his stomach was fill’d with meat and drink, especially such as did not agree with him, and had immediately thrown them up; certainly, there would be no occasion to be terrified by this vomiting. Now, then, as there seems to be another reason why the belly should be relax’d, we need not be under any great fear about this. Let a somewhat smaller quantity of water be drunk, and let it be a little medicated, so as to prevent it from relaxing the stomach. And as to the fomentation, (for I had heard that this was made use of) I make no doubt but it may be properly applied by you, provided it be somewhat more dilute than usual, and us’d more moderately; nor applied by means of flannels, nor on a great number of cloths. And it was not long after this that all the symptoms went off, and the patient recover’d; being still alive at the time of writing this letter, and in good health, though fourscore-and-six years of age.

But before I cease to speak of this fomentation, I would have you to observe, that almost all those persons that I said (*b*) had been sav’d without the trepan, which otherwise seem’d necessary, and others of the same kind, have been sav’d by means of this fomentation; or, at least, by something very similar to it; as, for instance, those whom Slevogtius (*i*) refers to in these words: “ By such remedies the most violent injuries of the head, that formerly had occasion for cuttings, burnings, scalpings, trepannings, and other dreadful operations, are every day cur’d by our surgeons:” and sometimes by these remedies “ alone;” so that by a French surgeon nam’d Pincon (*k*), a rustic was cur’d “ who lay speechless ten days, and was consider’d as desperate;” a young man by Grimmer (*l*), who had been seiz’d “ with a delirium, a vomiting, a fever, &c.” a boy by Trew (*m*), who was “ depriv’d of all his senses, paralytic” in the side opposite to the blow, and in the other “ perpetually agitated with convulsive motions.”

Yet frequently other remedies are join’d to it; and among these, when

(*g*) In addit. ad Obs. 15.

(*b*) N. 20.

(*i*) Dissert. de Carie Cran. § 20.

(*k*) Vid. Dan. Hoffman. Dissert. de sanat. cerebri quass.

(*l*) Obs. 87. supra. ad. n. 20. cit.

(*m*) Commenc. Litter. A. 1741. ibid. cit.

it was allowable, venæsections, that "the veins may be render'd hungry, " as it were, by having some quantity of their blood taken away," as Wepfer (n) speaks, "and may more greedily drink up the extravasated blood;" which that remedy I have spoken of, externally applied, and certainly penetrating by its efficacy where trepanning cannot reach and bring it out, (whatever its efficacy or mode of acting may be) "so disposes, as to make it fit " to enter the blood-vessels again." For thus he explains both his own observations, and those of others; as he even says above (o), "that he re- " members the dissipation" of extravasated blood "to have been brought " about very frequently in his country, with great success, by proper fomen- " tations; without the use of the trepan, and without any detriment to the " patient."

As to this reabsorption, however, I have written to you formerly (p) what has been observ'd in the brain after apoplexies that had formerly preceded, and even after an old wound of the head, without a perforation of the cranium, and have said whence I suppose this reabsorption to happen; for which reason I shall add no more. Nor shall I say any thing of another use of trepanning; I mean, that the bones of the skull, when depress'd, may be rais'd up, the sharp fragments extracted, and the prominent needle-like points of the internal lamina which has happen'd to be fissur'd: for how long, and in how great a degree, these may be injurious, the excellent observation of Platner (q), among others, shows by dissection: I shall not, I say, add any thing on this subject, lest, if I should say that some objection may be also made even to this remedy sometimes, which, certainly, other remedies, and nature itself, are less able to supply the place of; I should seem to give more credit to vulgar prejudices, than to the dictates of reason and of prudent practitioners.

22. For now, as I have spoken above merely of perforating the cranium, not only as much as is necessary to make the discourse that I had begun complete; but also (which I would not wish) to create a false and unjust suspicion that I am on the side of the people in this question, and have an immoderate aversion to this kind of remedy, which, when cautiously and properly applied, I readily confess to be very useful and even necessary: let us return to dissections. And as two of our Mediavia's remain, I will give you them before my own. The first belongs to those that have been already propos'd; I mean those in which, if there was any disorder of the cranium, it did not reach to the internal parts. And the second, to those in which the disorder did reach thereto.

23. A certain man, falling upon his face, dash'd his forehead against the ground on the right side, about the middle of the bone. No vomiting, nor any other symptom, happen'd immediately after the fall, except some slight disorder of the stomach. But soon after, he was seiz'd with a considerable fever, and a sleepiness. About the fourth day, both of these symptoms went off: and he was well. He remain'd in the hospital, however, for the cure of his wound, which was of a good colour, together with the bone

(n) Schol. supra ad n. 17. cit.
(o) Exercit. supra ad n. 20. cit.

(p) Epist. 2. n. 16,
(q) Institut. Chirurg. § 532. not. d.

that was laid bare. About the seventeenth day a violent fever came on again, and a heavy sleep. The colour of the wound and of the bone became brown. The bone was scrap'd, and appear'd to be white beneath. Yet the man died with the same, and no other symptoms, about the twentieth day, which was the twelfth of April, in the year 1740.

Upon opening the skull, a fissure was indeed observ'd therein, which pass'd transversely a little above the eye-brow, that lay under the wound. But this did not reach to the internal parts. However, where the bone had receiv'd the blow, there, betwixt itself and the dura mater, lay a little of a kind of jelly as it were. And the corresponding hemisphere of the cerebrum was of a black colour, inclining to green; nor yet in that place only, but every where; and had a very putrid smell. This colour descended quite to the lateral ventricle itself, infecting all the parietes thereof, the basis excepted. Moreover, the anterior part of that ventricle was not lacerated; but dilated to such a degree, as to contain a quantity of coagulated blood, equal to the size of a man's fist. The remaining part of the ventricle contain'd a bloody serum, as the left did also.

24. The blood which was found within the ventricle, was certainly effus'd from some ruptur'd vessel, either of the plexus choroides, or of those that pass through the surface of the parietes of the ventricle. But shall we suppose that vessel to have been slightly ruptur'd, at the time when the head receiv'd the blow, and that the blood had begun to be distill'd slowly, and by degrees, from that time? or shall we only suppose it to have been weaken'd then; and, finally, that a gangrene of that hemisphere coming on, it was ruptur'd, and pour'd out its blood hastily? If you should choose to suppose the latter, you will, in my opinion, less easily explain why the man did not then die much sooner, and with other symptoms, almost like an apoplectic person; and how, without any laceration of the substance, the ventricle was so dilated; so that it is most probable the blood was discharg'd gradually and slowly, till it increas'd to so great a quantity; and that the ventricle gave way gradually in proportion.

Nor let it be any objection with you to this hypothesis, that the man seem'd to be very well from the fourth day to the seventeenth, without a fever, or any symptom whatever. For it is not only to be suppos'd, that to a gangrene so widely diffus'd, a deprav'd disposition in the brain must have preceded; but even in the most considerable diseases of this organ, it does not very rarely happen, that either some slight symptoms thereof, or none at all, are observ'd, even for a much longer space of time.

Call to mind, I beg of you, those things that are produc'd above (r), from our observation, or at least from the observation of Marchetti. Read, not so much the ninth-observation of Fantonus the father, as the scholium of his celebrated son to the twenty-fifth. And to omit that of Avignon (s), which is an extremely rare observation, as therein, though so great an injury of the cranium, the meninges, and the brain, had taken place; as the course of the cure demonstrated; yet no symptom existed, from the beginning to

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the perfect completion of the cure, that is, to the seventy and sixth day; there is a history in Bohn (*t*), from Lamzwerdus, of symptoms not succeeding to two fissures of the sinciput, till the thirty-sixth day: and there are others from Montanus in Rouhault (*u*), wherein the symptoms did not come on till the seventeenth, twentieth, or twenty-first day, when they generally prov'd mortal; and this happen'd at Antwerp, for the space of a whole year, to the greater part of those who had, in this period, receiv'd blows upon the head.

Read those observations, moreover, which Poupart, and particularly Vacher, have communicated to the Royal Academy of Sciences at Paris (*x*). From these, and from others that I designedly pass over, you will cease to wonder if at any time, as in one just now propos'd by us, so in some others that are given either in this or the former letter, you shall see that considerable disorders lay hid in the brain some days, without any bad symptoms, and in particular without any fever. There are a great number of things in this organ, not only in a natural state, but in a preternatural state, of which we know not how to conceive.

And that our ancestors also were properly and justly surpriz'd thereat, you will understand even from what is added to the observation of Salmuthus, in this section of the Sepulchretum (*y*); which observation relates to the present subject in almost every view: this addition is taken from Berengarius, or, if you please, from Carpenfis, as they more frequently call him from his country: and this is a circumstance, the want of attention to which has deceiv'd a very modern, and, in other respects, not unlearned surgeon, who, having said that Berengarius had sometimes perforated the cranium upon the very futures with success; immediately says, that Carpenfis had done the same, as if Carpenfis had been quite another person.

But from a lingering death, after a blow of this kind, let us come to a very speedy one, as in the second observation that I have promis'd you.

25. A country-woman falling headlong down stairs, hurt her head in so great a degree, that having lost the power of speech, and of motion, but especially in her lower limbs, and discharging blood from her nostrils, and one of her ears, she died within an hour.

The basis of the cranium, which contain'd a large quantity of extravasated blood, was broken transversely, the fracture passing from one side to the other, before the ossa petrosa, through the posterior parts of the sphenoidal sinusses; the bony part of the meatus auditorius being also ruptur'd, together with the membrana tympani in that ear which had discharg'd blood. The lateral sinusses of the dura mater were also ruptur'd: and, besides the other injuries, the cerebellum itself was somewhat injur'd.

26. If besides this injury of the cerebellum, whatever it was, there had not been other very violent ones, such as a very great concussion of the cerebrum, and a very great compression both of cerebrum and cerebellum, in proportion to the quantity of blood extravasated within the cranium, and

(*t*) De Renunc. Vulner. Sect. 1.
(*u*) Tr. supra ad n. 14. cit. c. 11.

(*x*) Hist. de l'A. 1700. Obs. Anat. 19. &
de l'A. 1743. Obs. Anat. 12.
(*y*) § 3. Obs. 10.

particularly from the rupture of the lateral sinusses; do you think death would have come on so soon? I confess I should not readily believe it; notwithstanding I know that considerable and sudden injuries of the cerebellum are, for the most part, wont to be more speedily and suddenly destructive, than equal injuries of the cerebrum; at least in the more perfect, as they call them, and adult animals, and those that approach the nearest to the structure of man.

In this controversy therefore, which I have fall'n upon by chance, and of which I remember that you have formerly ask'd my opinion, do not, in concert with men in other respects very learned, take notice not only of insects, but not even of birds, or fœtusses, or newly-born animals of any kind. For Aristotle (z) himself has even observ'd formerly, "that this evidently happens in insects, as in wasps and bees;" that is to say, when the part "which is call'd the head is taken off, they still live." And it is so long since as when I was a very young man, that Valsalva affirm'd to me he had irritated, to a very great degree, the cerebellum of birds, and yet that they had not died immediately.

And, indeed, I myself can relate what I saw of this kind in two cats, which were two days old, when I open'd the heads of them while living, and in the summer time. For one hemisphere of the brain being laid open in each of them, and the use of the pia mater, in confining the brain, being observ'd; for where it had happen'd that a small part of this membrane was lacerated, there a small part of the brain extruded itself, and became prominent; I took away the whole of that hemisphere piece-meal: and yet the power of feeling and moving did not seem to be lost, or even in the least diminish'd, in the corresponding and opposite limbs. Nor indeed were these faculties lost when I had soon after wounded the cerebellum of the other cat.

But they were immediately lost upon cutting deeply into, and tearing asunder, the cerebellum of the other, and the beginning of the spinal marrow; they were lost, I say, in the limbs, and the whole body, as much of it as then presented itself to my eyes; if, however, you except the heart, and its auricles; for the motions of these cavities, and of that viscus, still continu'd lively and vigorous: and even when, some little time after, I cut off the head from the trunk, this motion nevertheless continu'd the same, as if I had not cut it off. Cutting off the great vessels therefore, soon after that, I took away, together with them, the heart; which then finally soon grew quiet: although not long after this I perceiv'd, by compressing it betwixt the fingers, that it was acting even then by a powerful exertion.

I know therefore that they say truly, who have asserted, that cats hold out the longest of almost any animals, in anatomical experiments. Yet I understand, at the same time, that if we attend to those things which we observe in this kind of animals, especially when newly-born, and still more to what is observ'd in insects, birds, and human fœtusses themselves; as, for instance, those that are sometimes born not only without the cerebrum and cerebellum, but also without the medulla oblongata and spinalis; I say, if we attend to these things, it will, I see, of course happen, that many consequences seem

to arise therefrom, which argue against the uses of both these medullæ and cerebrum; not to say against the uses of the cerebellum itself.

I likewise would not have you here attribute too much to certain disorders of the cerebellum, which are generated in a longer or shorter space of time, but certainly not suddenly. Of the former kind are these: from Mauchart (*a*), and from Littre (*b*), of the cerebellum being indurated in two hydrocephalous children, or scirrhus; yet in such a degree only that in the latter, two, although very small, places remain'd, wherein the cerebellum was in a natural state: and in the former, one of the lobes was less enlarg'd, as well as less indurated: from Brissæus (*c*) also, a hard tumour, but one that had form'd itself in the middle of the cerebellum: from the celebrated Lieutaud (*d*), a bone of no small size within one of its lobes: from Peyron (*e*), the whole cerebellum converted into a membrane, which involv'd in it a body of the bigness of a hen's egg, made up of many and hard glands; into which body some will perhaps suspect that the cerebellum had been chang'd; as seems to have happen'd formerly in regard to the cerebrum; rather than into that membrane: and to have been conceal'd under that appearance, just as they would of some parts of the cerebellum itself, in which Harderus (*f*) found three small globules; for the largest was in the beginning of the medulla spinalis: or of Wurffbainius (*g*), who found several small glandular bodies in the cerebellum, which was yellow and foetid indeed, but not putrefied; or of Flascus in Lancisi (*h*) (for Lancisi did not see it) who found a body made up of many globules.

Nor indeed did that scirrhus belong to the whole of the cerebellum; as some seem to hint, and as others expressly affirm; which the celebrated Haller found in a beggar girl, as this gentleman asserts (*i*) that it had occupied "the middle part of the cerebellum," that is, "the left lobe;" so that it certainly did not equal that which I found in the cerebellum of a man in the beginning of the year 1754, as this, though less hard, and less compact, besides occupying the same lobe almost wholly, occupied the middle part also, and the nearest portion of the right lobe, as you will learn from the history which I shall send you on a future occasion (*k*).

And to the second kind of disorders in the cerebellum belong, if you readily set aside the observation which Peyron (*l*) has also produc'd among some of those above, as others likewise have done since, from Fantonus the father, since the very eminent son (*m*) thinks, that instead of the cerebellum being "corrupted," we are to understand only, that it was soft, and not of the natural colour; to this second class, I say, belongs, first, that observation which is made by Massa (*n*), of an abscess in the cerebellum, after a wound of the sinciput "being suppurated with a laudable pus:" and in the next

(*a*) Eph. N. C. Dec. 3. A. 4. Obs. 59.
 (*b*) Hist. de l'Acad. R. des Sc. A. 1705.
 Obs. Anat. 13.
 (*c*) apud Platner. Inst. Chir. adnot. ad § 548.
 (*d*) Hist. de l'Acad. R. des Sc. A. 1737.
 Obs. Anat. 8.
 (*e*) Mem. de la même Acad. A. 1741.
 (*f*) Apiar. Obs. 58.

(*g*) Eph. N. C. Dec. 2. A. 9. Obs. 237.
 (*h*) De nox. Palud. Effl. 1. 2. Epid. 2. c. 6.
 (*i*) Opusc. Pathol. Obs. 1.
 (*k*) Epist. 62. n. 15.
 (*l*) loco indicato.
 (*m*) Schol. in Edit. ult. ad eam Obs. quæ
 9. est.
 (*n*) J. Introd. Anat. c. 28.

place, one written to me by a friend in the year 1735, of the right lobe of the cerebellum being penetrated, universally, by a green and foetid sanies, after having affected the neighbouring temple-bone here and there with a caries, and corroded the dura mater: and again one of mine, which, if you consider the cause, is not unlike this, and which I have sent to you formerly (o); but unlike in this circumstance, that the sanies had vitiated the same lobe of the cerebellum superficially, and that only in some measure: and, finally, a fourth of the celebrated Plancus (p), of an abscess which occupied two third parts of that lobe.

Nobody, certainly, has ever been carried off immediately and by a sudden death, in consequence of one or the other kind of disease, when he seem'd to be in health; nor has the disorder even been form'd suddenly: and to those disorders that are generated by degrees, the nature of the body accustoms itself in some measure, and supplies, from some other part, as far as lies in its power, what is wanting in the diseas'd part.

An example of this kind I will produce in the nerves themselves. For what do you suppose could be the reason that a dog, whose recurrent nerve, both on the left and right side, was cut by the celebrated Emmet (q), recover'd in some measure, the following day, the voice that he had lost immediately on the incision, and continu'd to recover it more and more every day?

The third recurrent nerve, you will say, as it lies behind the aspera arteria, could not be divided. But this unusual nerve had certainly existed the day before; and other small branches, I suppose, had existed, that arose from the par vagum, above the section of these nerves, when perform'd by Valsalva (*), or from some other nerves that went to the larynx, in a whelp, which, though she strove before in vain, could at length bark on the ninth day.

That is to say, either I am deceiv'd, or the spirits, which could no longer pass through those larger nerves that were cut asunder, had, by this time, sufficiently dilated, for themselves, the passages through the lesser nerves, which were before not sufficiently open, and which communicate, higher up, with those larger ones, either on the outside or the inside of the brain, and go to the same place. I say sufficiently dilated; for in men that are affected with increasing disorders of the cerebellum, to whom you will transfer these remarks, it is scarcely probable, that, after these disorders have wholly occupied the cerebellum, the motion of the heart and the lungs should have been so vigorous and strong as before: nay, indeed it is asserted by some of them, as in the boy spoken of by Littre, that the respiration was weak, and that the pulse was very small: and, in the observation which I have said was written to me, a languor was taken notice of: and in that also which I have sent to you, it appears, that the strength of the pulse had been quite sunk and diminish'd.

It would be much more difficult to satisfy the objection which I remember to have read in the work of some grave author; for who he was I can-

(o) Epist. 14. n. 3.

(p) in Append. ad Epist. de Monstr.

(q) Tentam. de Cur. Morb. Cephal. n. 30.

(*) Epist. Anat. 13. n. 37.

not remember ; I mean, that in a thief, whose memory was very weak, no trace of the cerebellum was found by Benivenius : if Benivenius (r) had not written the following words only, “ that the posterior part of the head, “ where the seat of the memory is, was so short in this thief, as to contain a very small portion of brain ;” so that if any one, by reason of that ancient credulity of the seat of the memory, should be willing to understand this of the cerebellum, rather than of the cerebrum ; he, nevertheless, does not acknowledge, that the cerebellum was entirely wanting.

This then being the state of the question ; let us set these things aside, and returning to that point from whence the controversy took its rise, and by which it may be more easily decided ; let us compare considerable and sudden injuries of the cerebellum, with considerable injuries of the cerebrum, and even, if you will, with very violent and sudden injuries, such as happen from wounds.

27. That there are some wounds of the cerebrum which bring on a very speedy death, we are so far from having it in our power to deny, that it is rather to be wonder’d at, that two observations, and no more, should be pointed out, to this effect, by some very learned men, in neither of which death immediately follow’d ; whereas, on the other hand, no body can be ignorant, from the experiments of many of the most excellent authors, that wounds inflicted on the cerebellum are wont, for the most part, to take life away, either immediately, or in a very little time. For that they do not always kill with the same celerity, I have readily confess’d. But I enquire how many times, at length, and how slowly this has happen’d. Franciscus Antonius Cattus, professor of anatomy amongst the Neapolitans, has said, in a little work (s), which was printed at Naples in the year 1557, “ that he can easily prove by experiment,” a circumstance which he does not seem to have prov’d without a wound of the cerebellum. His words are, “ though all the other parts of the brain are wounded, death is not a “ natural consequence thereof ; yet when the posterior ventricle is wounded, “ I have seen that the animal immediately falls down and dies.”

But if, besides the cerebellum, which ; although it does not every where comprehend this fourth ventricle, as if proper to itself, as the cerebrum does its ventricles ; nevertheless compleats it, and immediately covers it ; you should choose to suspect, that with it he had also wounded the medulla oblongata, which lies beneath ; experiments would not be wanting (t), from whence you might understand, that sudden death does not necessarily, and of course, follow on account of this wound in particular.

It were to be wish’d, that Coiterus, in those anatomical observations, which he publish’d sixteen years after Cattus, had touch’d upon something in relation to the cerebellum ; since he also, as to what relates to the cerebrum of lambs, kids, and living dogs, outstrips the more modern authors, by making the following assertions : “ And what is a circumstance, that deserves the highest admiration ; I have laid open the brains of living

(r) De abdit. nennull. ac mirand. morbor. &c. causis, c. 89.

(s) Hagog. Anat. c. 25. in fin.

(t) Vid. apud Teubeler Dissert. de Vulnerib. cerebri non semper lethalis. §. 43. & seq.

“ brutes ; I have wounded them, and without touching the nerves, or their
 “ origins, and without wounding the ventricles that lie in the middle, I
 “ have taken them out, but have not found any sign of the voice, respira-
 “ tion, or sense being injur’d in these animals. Birds live some time with-
 “ out the cerebrum, as any one may experience in hens, or pullets, if he
 “ cuts off the upper part of the beak with half of the head, and takes out
 “ the greater part of the brain.”

But in the preceding, and the present century, curious and enquiring men have not omitted even to take out the cerebellum of birds. Thus the celebrated Zimmermann (*u*), having drawn out the cerebrum and cerebellum of a pigeon, the creature died suddenly and entirely : and that you may not be at a loss to determine from whence this chiefly happen’d ; he took away the cerebrum from another pigeon, which, nevertheless, liv’d some time ; yet, when the cerebellum was taken out, “ it perish’d suddenly.”

But not to recede, however, from the more perfect animals, as has been propos’d above ; when I first sent this letter to you, one dog of Chirac was made mention of in this controversy ; which, amongst a great number that died immediately, or not long after, had surviv’d twenty-four hours after making the experiment. But I now see that in the dissertation publish’d by the celebrated Zinnius, in which he has also given the experiment made by himself on the cerebellum (*x*), a dog is taken notice of, which liv’d as many hours after the perforation of that viscus ; and even another is mention’d, from which Petit had cut away a part of the left lobe of the cerebellum ; and yet this animal liv’d six days.

However, it is certain that these are very rare examples, and only a few in all, if they be compar’d with the great number of other instances, of dogs that we know to have died immediately upon the experiment ; or those which he himself confesses, from his own observations, and from the select observations of others, have but just dragg’d on their lives “ after the fourth or “ fifth minute ;” or “ almost for an hour,” as two or three did ; or “ for “ three hours,” as one did ; or at most “ for twelve hours,” as another dog did.

And if we enquire after instances of very violent wounds of the cerebellum, in the human species, which have not been very speedily fatal, I believe there will be scarcely more than two ; one of these is quoted by Peyron (*y*) from Petit, of a soldier who liv’d three-and-forty hours. The other you will read in the Sepulchretum (*z*), from Binningerus, of a Dutchman, who, unless some error has crept into the impression of the numbers, seems to have liv’d more than four days after the wound.

As to another example, of a servant-man from Borelli (*a*), I do not think it can be added hereto ; for I do not see, how the sword could pass through the orbit, and reach to the cerebellum, without wounding that part of the cerebrum which lies between ; and I think, certainly, that we ought

(*u*) Dissert. de Irritabil. §. 27. Exp. 7. & 8.

(*x*) in Schol. ad eam Dissert. partem §. 1.

(*y*) Mem. supra ad n. 26. cit.

(*z*) Sect. hac Obs. 8. §. 8.

(*a*) Cent. 2. Obs. 19.

are even some of wounds penetrating quite into the ventricles of the brain, Augenius (r), and even Galen himself (s), testifying that they had seen them: so that I cannot help wondering that, in a certain scholium of the Sepulchretum (t), it is remark'd as "probable, that some wonderful wounds of the head, with an evident injury of the brain, some small parts of which have even been taken away without destroying life, were not mortal, because they were found to have affected the surface only, the medullary substance being unhurt; for where this substance is touch'd, death must be the consequence."

For if those observations had been read, it would have been known, from many of them, not only whether the injury had reach'd to the medullary substance, but also whether a portion of the cortical substance only was taken away, as in that wound of the cerebellum in Platner. But you may, besides those, read some others that are really wonderful in Martianus (u), from whom nobody, that I remember, has yet quoted them; and others, in like manner, in Wepfer (x) and Saltzmann (y); to omit others at present: the latter of which authors, however, like Bohn, after having recounted many cures of large wounds of the cerebrum, has expressly excepted wounds of the cerebellum (z), "as what experience proves to be always and absolutely fatal;" and Wepfer finishes his in such a manner, that after having mention'd a leaden bullet's having pass'd through the cerebrum in one person, and in another through the cerebellum and cerebrum, he declares the first to have died "soon after," but the latter "instantly."

How much more speedily and more certainly, then, wounds of the cerebellum are generally mortal, than those of the cerebrum, has been sufficiently confirm'd by us. Now let us go on to our observations of the cranium being fissur'd or fractur'd.

28. A virgin, of seventeen years of age, of a pallid colour, happen'd to be talking with a lover of hers, with whom her father had forbiddeh her to talk, when on a sudden her father surpriz'd them together. As he was a fierce and savage kind of man, and not quite sober, he snatch'd up a thick club, wherewith he struck the arm, but particularly the head, of his daughter, with such violence that the club was broken.

In this wounded condition the poor girl was carried, four hours after, into the hospital of St. Mary de Morte, at Bologna. She made no answer to any question that was ask'd her; and her pulse was so low, that they did not dare to take away blood. In the arm was one slight wound; but in the head were many and considerable wounds; and, amongst these, one in particular that was extremely large, and seem'd to give her the most pain, lay behind the left ear, from which a perfect sanies afterwards flow'd out: and with this the wounds were a little moist.

Within about four days the patient began to make answers to the questions which were ask'd her, but very little, for the most part; as, for instance,

(r) L. 9. Epist. 2. quæ esse deberet 3.

(s) De Us. Part. 1. 8. c. 10.

(t) Ad § 8. Obs. 5. hujus Sect.

(u) Annot. ad Hippocr. Epid. 1. 7. S. 1.

(x) Exerc. de loco aff. in Apopl.

(y) Dissert. de mira Cran. Fract. § 10. & seqq.

(z) § 12.

either to affirm or deny. In the mean while, the pulse became vehement and frequent; and the fever was observ'd to increase every day in the evening. Then the menstrual purgation came on in its proper time, nor ceas'd to flow till the time of her death; which follow'd a few days after, in a gradual and placid manner, after the fever had come on once only, and that three days before death, with a short and slight coldness.

The body of this virgin was very useful to me in the year 1704, together with other bodies, when I was very busy in examining the genital parts both of virgins and women; in order to investigate those things that I have spoken of in the first *Adversaria* in regard to the hymen, the valves of the cervix uteri, the sources of the menstrual blood, and other circumstances of that kind. Though the menstrual blood did not cease to flow quite to the time of death, as I have said; yet, as it flow'd much more slowly in the latter part of her life, it had coagulated into the form of a thick cylinder, within the vagina and the cervix uteri; just as the blood which is receiv'd into a glass-vessel from a vein is wont to do; and seem'd to have dilated the os-culum uteri and cervix: unless you chuse to attribute this to the natural laxity of the parts at such a time. Nor was the whitish part entirely wanting in that sanguineous concretion.

But it is more worth while to remark, in a few words, what I observ'd particular in the fundus uteri and the testes. The anterior surface of this fundus was unequal with three or four little furrows, drawn in a longitudinal direction. And the membrane which invests the testes show'd some small cicatrices, as it were; amongst which, in one of the testes, appear'd something similar to a little ulcer, being unequal in its surface, and of a yellow colour inclining to blackness. Through a foramen which was manifest therein, a thin probe was pass'd down by me into a cell that was not very small, but empty. And the vesicles, which in these testes were not wanting, but were full of serum, being cut into after boiling, show'd not the least of a coagulated humour; and only contain'd, within a thickish coat, a sinus that was perfectly empty. All these things, however, were seen last in order.

But as to the head, which had been already dissected, all the wounds appear'd of a cineritious and ill-looking colour; and while the integuments were taken off from it, many disagreeable colours appear'd; and among these a black colour. The cranium, when laid bare, show'd the lambdoidal suture to be somewhat open'd; and at that place behind the ear, in which I have said that the wound was the most considerable, a large part of the bone was broken; and so disjoin'd from the other parts, that it easily follow'd the hand which drew it away.

The skull being cut through round about, and examin'd both internally and externally, show'd two fissures, that penetrated through both tables; the longest of which fissures began from that place where the large fracture was. And the inferior part of the left hemisphere of the cerebrum, which answer'd to this place, was corrupted to as great an extent as a small apple would have occupied. The other parts we found to be sound, if you except the dura-mater only, which had a kind of slight ecchymosis where it lay under that longest fissure.

29. Besides this, and perhaps others, I also made, in the same hospital, that

that dissection belonging to this class, which is already sufficiently describ'd in the *Epistole Anatomicæ* (a). From which, besides other things that I have hinted at, in this and the former letter, you will see this circumstance confirm'd in particular; that blood is sometimes effus'd, not where the skull has receiv'd a blow, and been fissur'd, but within the part opposite thereto.

Now let us go on to some dissections perform'd at Padua, beginning with that in which, like the former, we saw the skull to be fissur'd by the blow of a stick.

30. A certain man, who was a native of Genoa, blind of one eye, and liv'd by begging, being drunk, and quarrelling with other drunken beggars, receiv'd two blows by their sticks; one on his hand, which was slight, and another violent one at the left temple; so that blood came out of the left ear. Yet soon after, the quarrel being made up, he sat down at the fire with them in the same place; and again fill'd himself with a great quantity of wine, by way of pledge of friendship being renew'd: and not long after, on the very same night, he died.

The body was warm even on the day following, although it was in the latter end of January, in the year 1746, when it was brought into the college before night. And as I was teaching anatomy at that time, it was dissected on the following days; for it was a proper body for the purposes of demonstration; although there was an ulcer at the lower part of the left tibia, and the scrotum was tumid, as if from an ecchymosis; being, at the same time, of a red and violet colour, and the belly in particular distended.

For when the abdomen was open'd, it was found that the tumour was from the stomach, which had been so distended with wine and air, that I never remember to have seen it more so; whereas the intestines, and especially the small ones, were almost empty; so that some persons hop'd in vain, as in a man who died soon after having drunk so much wine, that they should see some chyloferous vessels in the intestine and mesentery; although in the beginning, while the stomach, which was even then full, was rais'd up with the hand towards the left side, we most of us were impos'd upon by the appearance of a chyliferous vessel, that ran parallel to the gastro-epiploic vessels, on the external surface of the stomach; yet it was immediately perceiv'd, that this was either a nerve, or something else of that kind, as it had no appearance of valves, and when dissected and compress'd, gave out not the least moisture.

The abdomen, the mesentery, and the omentum, which we found to be drawn upwards, were fill'd with a yellow fat. The spleen was one of the largest I have seen, in every dimension; but especially in its breadth and length: and in its longitudinal direction it was wrapp'd up into itself on its flat surface. Internally it was of a dilute and pale red; but no where hard. Nor was the liver hard: large indeed it was, but within natural bounds: and the gall-bladder was full of yellow bile. The urinary bladder also was full of urine; so as to be prominent above the ossa pubis by three inches.

The urethra was without our canaliculi, at least as far as appear'd to the eyes; though perhaps from a foregoing disease. For the glans could not be

disengag'd from the prepuce, in the whole of it, without dissection. Nor was the part which could be disengag'd, that wherein the extremity of the urethra opens. Within the scrotum was no disorder. Nor within the thorax: nor any thing worthy of remark therein; except that, in the cavities of the heart, and great vessels, the blood was free from all polypous concretion, as it also was in all the remaining vessels of this body.

But the head offer'd many things worthy of remark. The muscles of the face, the membranes which lay betwixt them, and the parotid glands, were ting'd with a kind of bright red colour degenerating into brown. These glands were large; and perhaps from the same cause, that is, from the blood having stagnated there: for the thyroid gland also, and particularly the internal maxillary, were enlarg'd: could this have happen'd because in gluttons of this kind, they grow large in consequence of being more frequently and more violently agitated? The left temporal muscle, I mean that which had receiv'd the blow, was black in the whole of it, except in that part which is nearest to the forehead, from the stagnating blood that was effus'd betwixt the fibres of the muscle in such a degree, as to be discharg'd to the quantity of some spoonfuls during the dissection.

The cranium being saw'd open; in which, instead of the frontal pituitary sinusses, the substance of the bone was found to be spongy; betwixt that and the dura mater, where it lay beneath the part which had receiv'd the blow, we found blood half-coagulated, to the quantity of two or three ounces; extending from the posterior part forwards, to the space of four or five inches, and from the basis of the cranium upwards, almost as much. From the compression of this blood, the dura mater, and the brain, had very evidently subsided for as great a space as I have said was occupied thereby.

Moreover, the sanguiferous vessels in that membrane, and still more those in the pia mater, were so distended, that even the smallest ramifications were every where beautifully red, yet most on the right side; perhaps because the man, when dying, had lain on that side in consequence of its being less affected with pain. Or perhaps, as to what relates to the dura mater, because the vessels of this membrane could not be equally full on the left side, as they were on the right, by reason of so much blood having been effus'd: although, even at the basis of the right hemisphere of the cerebrum, betwixt that and the pia mater, we observ'd blood to be extravasated to some extent; but in so small a quantity, that it seem'd rather to be a livid appearance, as if from contusion, than a real extravasation.

That there was a like plenitude of the vessels, in proportion, in the medullary substance of the cerebrum, and not only there, but in the substance of the cerebellum also, we perceiv'd by the pretty large bloody points, that were seen here and there throughout each of these substances; and throughout the parietes of the lateral ventricles we saw the vessels themselves to be distended: although the choroid plexusses were pale, in consequence of a little and somewhat turbid water which was contain'd in those ventricles.

Having seen these things in the manner describ'd, we turn'd our eyes to the cranium, which was cut out; and, in the left temple-bone, we observ'd almost a capillary fissure, but such a one as penetrated from the external to the internal parts. This fissure began at the breadth of a little finger, above that

that place where the scull had been cut into, as it usually is. It was continu'd to the basis of the cranium, and extended itself quite to the common superior terminations of the internal meatus auditorius and tympanum; for which reason the membrane that disjoin'd the one from the other, was broken through: the latter cavity being full of blood, and the former of a bloody appearance.

Having thus found out the causes which had ruptur'd the internal and external vessels, and consequently the causes of blood being effus'd within the cranium, and discharg'd from the ear; it remain'd in a man who, as I have said, was blind of one eye, to examine this eye. It was the right eye. The tunica adnata of which was distinguish'd with a great number of vessels, going to the circumference of the cornea, and particularly in one part.

The cornea was not only opaque, but also much less than it ought to be, and not of its usual figure. The eye being then taken out of the orbit, the globe itself appear'd to be considerably less than is natural: and indeed did not strictly resemble a sphere; but rather one of those bodies, which, amongst us, we call *bottoni* or *buttons*; I mean, those that we make use of to keep our clothes together; being depress'd on one surface, and on the other, protuberating in the manner of a low cone. Yet, as of these surfaces the former was here anterior, and the latter posterior, the diameter of the anterior surface was much longer than the axis, or a right line drawn from the middle of this surface to the middle of the posterior surface.

And having divided this eye, which was hard, into two parts in the direction of that line, and nothing having been discharg'd but a humour, which, if it had not been of a blackish colour, you would have call'd aqueous, I in vain sought for the remains of the chrystalline or vitreous humour; for not the least trace of them remain'd. But under the contracted tunica sclerotica was the choroides, betwixt the brown colour of which, a bloody one, as there generally is, pretty evidently appear'd here and there; and the uvea also was annex'd to the choroides, but not sound and entire like the choroides; so that we could not distinguish the iris and the corpus ciliare.

Under the choroides universally, instead of the retina was a thin bony lamella, which; proceeding from the insertion of the optic nerve, being every where entire, preserving that figure of the eye which I have describ'd, and comprehending the aqueous humour whereof I spoke; extended itself quite to the circumference of the cornea, where it adher'd to the uvea more closely than in any other part, as I again observ'd, even after having macerated the dissected eye six days in water. The pieces of this lamella, which was really bony, I still preserve carefully by me; some of which, being pretty large, may, by their figure, and the adhering portions of the uvea and choroides, gain credit to a circumstance so extremely rare; if not hitherto unseen by any one; with those who were not present at that time.

Those who were then present, however, both doctors in medicine, and students, having sufficiently examin'd these things, and it having appear'd, even from inspection, that the blindness had been of long standing; whatever the cause of it might be, which could neither have been enquir'd from the man himself, nor yet from others, as they were ignorant of the life of a beggar, who had been born in another country, and had spent the greater

part of his life there; it did not seem proper to omit enquiring into the state of the optic nerve of that eye, and comparing it with the other which went to the left, that is the sound eye.

The difference then, betwixt one and the other nerve, was immediately evident to all, even without dissection. For the left was in the state that the most sound optic nerve generally is. But the other was more depress'd, thin, and of a faint flesh-colour; and in this state it appear'd from that place where it had been join'd with the other, within the cranium, quite to its insertion into the eye. And indeed in the whole of this tract, in which it was invested with the dura mater, when it was cut transversly, it seem'd to be the section of some artery or other, rather than of a nerve; in consequence of the dura mater being contracted into itself, and become thicken'd: and of the tubulus form'd thereby, having its cavity fill'd with a mucous substance, of the very same colour that I just now describ'd.

But what appearance it had in the point of conjunction, we could not enquire; as that part had been accidentally injur'd before, in the dissection of the cerebrum. From that place, however, inwards, to the extent of two inches, not the least difference could be observ'd, by any one, betwixt the right and left nerve; for neither of them, like the right below, was softer than usual, of a mucous nature in its substance, reddish in its colour, or extenuated; but both of them show'd an equal firmness, thickness, and whiteness.

31. Although this history was pretty long, yet it will be sufficient to tack a short annotation thereto. I would have you, therefore, compare what I have said of the optic nerve of this blind eye, with those remarks that you have in the thirteenth letter (*b*): and you will perceive that all my observations of these things agree very well with each other; but that this last, as far as it relates to the eye itself, contains something more remarkable and rare, than the others; I mean, the change of the tunica retina, in every part of it, from a very soft and nervous substance, into a hard and bony plate.

For how rare an appearance this is, you may imagine from hence, that the very learned anatomist Haller (*c*) having since lit on a circumstance similar to this of ours, says, "I have read of some little stony particles being found in the chrySTALLINE humour; but whether a disorder of this kind in the retina has ever been seen, I do not know." The changes in the other parts of the eye itself, into a bony or a stony nature, are also rare; though not so rare as the former. For do not too readily believe that so many have been seen as are recounted in a certain collection; unless you first find them in books, which are, in my opinion, too hastily pointed out therein.

To me, at least, it happen'd, contrary to my expectation, when I examin'd four or five of those which are in my hands, that I found nothing, or at least nothing to the purpose, in the places which are pointed out; except one, which however was improperly referr'd to: and this you will observe moreover to belong to the tunica sclerotica, which was not "found bony" indeed, as is there said, but was found to have a bony scale inherent in it; as you will see if you inspect Blasius, not in book the sixth, chapter

(*b*) n. 7. & seqq,

(*c*) Opusc. Pathol. Obs. 53.

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the eighth; but in part the sixth, medical observation the eighth; whereas, in the eighth table, figure the thirteenth, Gunzius (*d*) has laid what kind of bony lamella he had afterwards seen “ betwixt the laminae of the choroides.”

But the celebrated Morand (*e*) had produc'd an example long before; so that it ought not to have been omitted in that collection, especially as it was rare, and, as he himself says, “ perhaps the only example” of an ossification within the globe of the eye. For, besides the chrystalline humour, which was of the consistence of a very hard stone, he found a pretty thick little bone betwixt the choroides and the tunica retina, convex posteriorly, and anteriorly concave. Finally, not to add any thing more of indurations of this kind in the parts of the eye; you will remember what kind of a small bone we found, in the place of the chrystalline humour, in a woman of whom I have written to you before (*f*).

The other circumstances in the history last propos'd, which relate to the blow on the head, you see it is needless to explain again in this place; after what we have so often hinted in this and the former letter. But as to the discharge of blood from the ear, by what way, and in what manner, it happen'd in this man; you will, of yourself, sufficiently remember, even without my giving any hint, that the same thing had happen'd in others likewise: that is to say, in those whom this letter (*g*), and the thirteenth, in like manner (*h*), make mention of.

32. A porter, who was not yet forty years of age, and of an excellent habit of body, being drunk, fell down as he was walking, and hurt his forehead very much; from whence a considerable lividness appear'd in that part. He also vomited at the time of falling, but no symptom appear'd afterwards, beside one, which was a very considerable symptom; I mean, that he lay torpid, without taking any thing, and without speaking, except that when the surgeons gave him pain by their applications, he then complain'd vehemently, and sent forth a great cry. In this state, being brought into the hospital, he died within the fourth day after the fall, at the time when I was giving anatomical demonstrations to the students there; that is, about the beginning of December in the year 1741.

The os frontis, in the part where it had receiv'd the violence, I saw to be cleft asunder with a very long fissure, both externally and internally; under which fissure was grumous blood within the cranium, but not a great quantity; nor did I find any other appearance, besides this, which related to the blow. For as to the little bone which I found not very far from the fissure, betwixt the dura and pia mater of this man; that this had been form'd there long before that time, you will understand from the description thereof, which I have inserted in the twenty-fifth letter to you (*i*); and that it could by no means be consider'd as a scale, which, having been shaken from the internal surface of the bone, by the violence of the blow, had in-

(*d*) Progr. de Ozaena Maxill. prope fin.
(*e*) Mem. de l'Acad. R. des Sc. A. 1730.
(*f*) Epist. 13. n. 10-

(*g*) n. 25.
(*h*) n. 16.
(*i*) n. 8. initio.

sinuated itself within the meninges, as it had happen'd in that mason, whose dissection you have in the celebrated Fantonus (*k*).

33. In the same hospital of Padua, I demonstrated to my very numerous auditors, among whom was remarkable for his ingenuity, his study, and his diligence, that eminent man Jacobus de Scopulo; he, who a few years after was transferr'd into the number of the public professors, and who is a very prudent, experienc'd, and eloquent physician, if any other is; I say, I there demonstrated what parts had been fractur'd, by falling from on high, in a certain man, about the beginning of April in the year 1740, and in a young man, in like manner, before the end of November, in the year 1742. And although these histories relate to the thorax also, yet because the head had been very much hurt, I shall subjoin them here.

34. A man who was employ'd in pruning a high vine, fell headlong upon the ground, which was spread over with stones. He immediately lost the power of speech. Some cordial liquor having been pour'd into his mouth, as he lay half-dead, he vomited: and although his pulse, which had been contracted, discover'd itself again; yet all the other circumstances growing worse, and the excrements both of the intestines and bladder being spontaneously discharg'd, death follow'd within four hours after the fall.

The body, from the mouth and nostrils of which blood was discharg'd, was quite rigid; even at the thirtieth hour after death: and not flexible without the greatest violence. The sinciput was black from contusion, in more than one place; but most of all in that part where the common boundaries of this region and the forehead are. And indeed we presently found the os frontis to be fissur'd, almost through the middle of it; the fissure reaching from the external to the internal surface, and descending, in a direct line, from the sinciput: after which going through the arch of the orbit of the right eye, not far from the os ethmoides, and having pervaded the whole os frontis in that manner, it at length pass'd over into that part of the os sphenoides, through which the optic nerve goes into the orbit: and as you perceive, from this progress of the fissure, that it could not but go through the pituitary sinus; you likewise perceive how the blood could be discharg'd from the nostrils, as has been said, and from the mouth also, by communication thereof with the fauces.

Under the dura mater anteriorly, we found a fluid blood, though not in great quantity; and we also found a small quantity of the same kind of blood, and indeed, to appearance, mix'd with water in some measure, in both the lateral ventricles: and as this was fluid, it was less to be wonder'd at, that it was found in the third, and even in the passage to the fourth ventricle; as it might easily flow thither, especially while the body was mov'd.

The thorax being laid open, and the lungs; which (if you except the upper part of the left lobe, that was connected, by a very thin membranous little band, with the pleura) were every where free and unconnected; being soft, and found to be collaps'd into themselves, and altogether sound; al-

(*k*) De Observ. Med. & Anat. Epist. 1.

though where they were turn'd towards the back, they were of a red colour, as if from inflammation, as it was to be expected in a man who had died in a supine posture; when they were lifted up with the hands, we saw that as much fluid blood was effus'd into both cavities of the thorax, though in somewhat larger quantity into the right than the left, as exceeded six pints.

In the pericardium was limpid serum in very small quantity. We found the trunks of the pulmonary artery and the aorta, and even the heart itself, to be almost universally cover'd with fat; although the man himself was not fat: in the ventricles of the heart was but little of a black, and in some measure grumous, blood; except that at the venous orifice of the right ventricle there was a small polypous concretion. And from hence even the students could perceive, that what I had so often admonish'd against the vulgar error in regard to the origin of these concretions, was true; as it was certain that in a man who had been in very good health, a hydrocele excepted, this coalition could not have been form'd by the stagnation of the thicker and more viscid particles of the blood among the fibrillæ of the valvulæ tricuspidæ, till after death, or a little before.

These viscera being then taken away, and the blood I have spoken of being exhausted, we endeavour'd to find out from what vessels it was that this fluid had been effus'd into the thorax, and perceiv'd that it was from the intercostals; some of the upper ribs, on both sides, being broken not far from the spine, in such a manner, that their unequal extremities had pierc'd through the pleura, and were somewhat prominent within the thorax. And there was at and about those parts a large blackness, as if from contusion, by reason of the blood stagnating under the pleura.

When the carcase was turn'd upon its belly, and the muscles of the back remov'd, I not only found blood, which had stagnated under these muscles equally, and even in somewhat larger quantity, about the same ribs, but I also shov'd a circumstance which, in one who by falling down had broken the os frontis, was not very easily to be understood; that is to say, besides the ribs, six of the upper vertebræ were so broken, that considerable pieces of them were wholly divided from their bodies. But what I conjecture upon this affair you will see below (l). Now, then, you see, from the very great injury done to the vertebræ, and consequently from the injury of the included spinal marrow, why the excrements could not be retain'd.

In the belly was no extravasated fluid; nor did we find any thing of a preternatural appearance, if you except some little part of the liver being blackish, and a double hydrocele in the scrotum also: but as I have already sent you (m) a description of this hydrocele, there is no occasion to repeat it here. And this is the history of the man.

35. As to the young man; he was about four-and-twenty years of age, of a fat habit of body, and by trade a wool-comber. This young man, like the former, having fall'n from a high place, died within four hours from the fall. Yet this patient could speak a little to those who first ran to him on his falling, and ask'd him questions: after that he immediately ceas'd to speak.

The limbs of the carcase were rigid at the end of two days after death ; but after the third they became flexile. The sinciput, on the left side, together with a part of the temporal muscle, had a livid appearance, as if from contusion. While the cranium was cut open, a considerable quantity of blood flow'd out. And yet we soon after saw, that as much of the same fluid remain'd betwixt the cranium and the dura mater, as might be equal to the weight of three or four ounces. This blood was black, and form'd into coagula ; but in no other place than in the left side, below the os sincipitis, and at the basis of the cranium. Therefore, although a considerable quantity of serum was found in the lateral ventricles, I saw some of it to be turbid indeed, but not at all bloody. Nor were the plexus choroides very red : yet the vessels in the meninges were very turgid. Having observ'd these things ; nor was there any thing else preternatural within the cranium ; upon inspecting the cranium itself, and tracing on the fissure, which I had seen beginning in the left os sincipitis, I perceiv'd it to go through the subjected os temporum quite to the petrous process : and from thence we perceiv'd the same, or if another, join'd with the former, to be carried through that part of the os sphenoides which lies betwixt the os temporum and os frontis ; being produc'd from hence, where the percussion had been given, into that last region of the os frontis which makes the extreme part of the arch of the orbit of the eye. And this very long fissure was carried through the whole thickness of the bones ; so that, if with one hand you laid hold of the anterior part, and with the other the posterior part, of those bones that I have mention'd, and drew them asunder, you would evidently perceive that they gave way, and were moveable.

The bony parietes of the thorax also were not free from fractures. For, besides that the left clavicle was broken, we observ'd a lividness in the back, which lay near to the spine, on the left side in like manner, taking up in some places a more narrow, and in other places a more extensive, tract : and upon opening the chest, and exhausting the blood, which was found to be extravasated to the quantity of two or three ounces in the cavity of the same left side, we saw a large ecchymosis under the pleura ; and in this tumour one, at least, of the ribs which are about the middle of the length of the thorax, so evidently broken, in the part where they begin to be curv'd posteriorly, that the adhering intercostal vessels, together with the pleura, could not but be lacerated, and pour out their blood, both internally and externally. However, the lungs, which we seldom see in wool-combers, were entirely free from the pleura ; except that the upper and anterior part of the right lobe, only, was connected therewith by a small membrane. In the pericardium was no great quantity of serum : in the heart no polypous concretions were observ'd.

The abdomen being open'd, nothing was found to be in a diseas'd state but the ureters, which were not only preternaturally widen'd in other parts, but even at their very entrance into the bladder ; so that it was less surprising that the bladder, which we had taken care to fill with air, should show an almost equal distention in the upper and in the lower part.

36. For frequently, as has been already shown (n), a distended state of the

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ureters is the consequence of a great quantity of urine being long confin'd in the bladder; from whence it easily happens that this receptacle is relax'd, and that the figure of it is alter'd in consequence of this relaxation.

But to return to the bones which were fractur'd in this young man: as all the fractures appear'd to be on the left side, it is very easily conceiv'd, in respect to this patient, though with difficulty in the man (*o*), how the bones of the head and thorax were broken at the same time; as the body of this young man fell on its left side; whereas we must suppose that the man had met with some hard body in falling, whereby his head being fractur'd in the anterior part, and the direction of his body being chang'd, he might at length dash his back against the ground.

However, among other fissures of the cranium, this last, in particular, was found to be of such a length, and in such a situation, that you may compare it with those which are describ'd by Ruysch (*p*), by Poupart (*q*), by Mauchartus (*r*), by Schreiberus (*s*), and by others; so that it always appears, more and more, that the sutures and commissures of the skull were not made particularly for the purpose of restraining the progress of fissures, and preventing them from being produc'd into more than one bone.

And this I remember was first observ'd by me at Bologna, in the year 1702, in a body publicly dissected; the cranium of which had, in consequence of a blow upon one side, a fissure parallel to the coronal suture, but much larger than that; as it ran behind it through almost the whole cranium, except the basis, and pervaded both the tables. And this observation, if I had then written down the other circumstances, I certainly should not have omitted among those above.

37. Before we cease to speak of blows of the skull, I must not omit to say, that, when both of its tables are altogether unhurt, and the vessels of the meninges below are unhurt also, it sometimes happens, that the small vessels which go to the medulla, betwixt those tables, are broken, and pour out their blood; which, in process of time, being corrupted, and become more acrid; for this reason, that the "medullary juice," as is observ'd by the celebrated Nicolaus Rosen (*t*), is mix'd with it, and at that time, "by its stagnation and heat, degenerates into the worst kind of rancidity;" affects the internal table with a caries: and while the man has now forgotten the blow, and fears nothing of this kind, flows internally, vitiates the meninges, and brings on death.

More than one example of this kind is known to me and to others, and was known to the authors quoted by Bohn (*u*); as, for instance, to Jo. Peter Passerius, and to him, in particular, from whose commentaries on Hippocrates *De Capitis Vulneribus* I wonder that no dissection of the head is transferr'd into this part of the Sepulchretum; I mean Peter Paaw. And it even sometimes happens that both the tables are destroy'd from that cause; as was,

(*o*) N. 34.

(*p*) Obl. Anat. Chir. 47.

(*q*) Hist. de l'Acad. R. des Sc. A. 1700.

Obl. Anat. 19.

(*r*) Eph. N. C. Cent. 5. Obs. 32. & Cent.

9. Obs. 39. in Suture.

(*t*) Nov. Comm. Imp. Acad. Sc. Petropol. Tom. 3. in Physi. Obs. 3.

(*u*) Dissert. de Ossib. Calvar. P. 1. § 1.

not. f.

(*u*) Dissert. de Trepanat. Difficult. prope finem.

in particular, seen by the-chevalier whom I have already spoken of, Pius Nicolaus Garellius, one of the physicians to the Imperial court. The case is, at least, worthy of your attention, when couch'd in a few words; for which reason, I will in some measure contract it, from the account he sent to me by letter, and give it you here.

38. A woman, falling backwards upon stone stairs, receiv'd a violent blow upon the hinder part of her head; but, besides a short and slight stupor, which did not prevent her from returning home soon after by herself, and a small blackness in the contus'd part, which soon disappear'd, she seem'd to suffer no inconvenience from her fall at that time. At length, after some months, a tumour, not bigger than a filbert, appear'd in the part of her head which had receiv'd the blow: but this tumour, as it gave her no pain, was neglected by the woman, and grew larger by degrees, till, at the expiration of the third year, or thereabout, it became very large: at which time it was mistaken, by certain surgeons, for an encysted subcutaneous tumour, as it had neither chang'd the colour of the skin, nor gave any pain when it was press'd; and would have been cut out by them as such, if the woman had not refus'd to suffer the operation.

A little after, the patient began to have excruciating pains, which, beginning from the seat of the tumour, were so extended through almost the whole cranium, that to herself it seem'd to be bound hard with cords. These pains, indeed, were not continual, nor always equally violent; yet sometimes to such a degree as to bring on a slight delirium: and the longer they continu'd, the more frequent and violent they became. In this manner she went on to the sixth year. And no sooner was this year elaps'd, but behold! an apoplexy suddenly came on, and within a few hours kill'd the woman: this happen'd at Vienna in the year 1735.

The tumour being open'd, the cavity of it was found almost full of black blood; and not only concreted, but so dense, that being laid hold of with the fingers, the whole of it immediately follow'd; some portion of fluid blood being discharg'd at last. This disease, when the integuments were taken off, was found to begin from the part which had been formerly struck; that is, from the upper part of the os occipitis at the left side, and to be continu'd through the os sincipitis of the same side, so far as to be no more than three inches distant from the coronal suture.

It occupied, moreover, a part of the right sinciput; so that the whole of the caries extended itself six inches in breadth, and more than seven in length. Where the bones were not entirely pierc'd through, the substance of the bone appear'd reticular; and from the external surface of this reticular substance bony lamellæ were rais'd up here and there, most of them being thin like paper, but all of them very hard and acute: and hereby was form'd a beautiful appearance, as they resembl'd a kind of foliated fungusses, of different sizes, which had arisen by a kind of bony vegetation.

The dura mater was become very thick in the whole of that space where it lay beneath the diseas'd cranium, and adher'd much more closely than usual to the part of it which had formerly receiv'd the blow. The vessels that crept through this membrane preserv'd their natural bounds on the right side, but on the left were very turgid, and much dilated; and the traces of them were

were seen to be much larger and deeper (in the sound part of the skull which remain'd) on the same side, than on the right side. As to what remains, the vessels of the plexus choroides were also much distended with blood: and some portion of serum was found to be effus'd under the basis of the cerebrum.

39. However, Garellius was of opinion, that the small arteries, not only betwixt the tables of the cranium, but also betwixt other bones, are, by the injury and compression occasion'd from blows, dilated and distended into aneurisms: and that these aneurisms produce a caries even before they are ruptur'd, as other aneurisms which lie near to bones do; or that they produce this caries sometimes after they are ruptur'd. And he had been brought into this opinion by observing three thigh-bones, which he preserv'd together with the cranium describ'd. One of which thigh-bones show'd a tumour that it had been dilated into, of the bigness of a man's fist, corroded and perforated with a caries in several places, and sending forth three bony productions, the largest of which was equal to a finger in length and thickness; and it show'd, at the same time, the foramen through which the artery enter'd the bone, and which is very narrow in other bones, to be so much enlarg'd in that as very easily to admit the little finger.

The two other bones, besides the fracture which had formerly preceded, and was consolidated, had a tumour affected with a caries, and the foramen, which was hollow'd out in the bone for the artery, in like manner dilated. He, therefore, thought that this species of disease was not yet illustrated and explain'd as much as it deserv'd.

Thus far from his letters to me. But you may compare, in some measure, the tumour which he saw in that woman; on account of its situation, its very long-continu'd and violent pains, by reason of the included blood, and the part of the cranium beneath being rough with sharp bony prominences; with that which is made mention of from the English Philosophical Transactions, in that dissertation (*) which I have already commended, and which was publish'd under the auspices of the celebrated Kulmus in the year 1732.

In regard, however, to the external cause, and the slow beginning of the tumour after the blow; and in regard to no pain being felt for a long time, but afterwards a very severe one, though not continual; and in regard to the caries of the cranium, and the considerable hiatus; you may, in great part, compare it with that which we find taken notice of, in another woman, by Jo. Saltzmann (y).

40. As those wounds which are inflict'd on the face belong also to the head, when taken in a general sense; I thought it would be proper to add something in this place upon wounds of the eyes, nose, lips, and orbits. And of those which are not so much wounds of the eyes, as of the orbits and of the cerebrum, we have treated in the preceeding letter.

To which you may also add those that, after passing through the whole cavity of the orbit, have sometimes in men gone through the foramina and ultimate parietes of this cavity to the brain, and always in those sheep which

(*) De Exost. Stat. Clavic. c. 2. § 22.

(y) Aët. N. C. Tom. 2. Obs. 100.

Wepfer (z) saw, at Rome, to be universally depriv'd of all sense and motion as soon as ever the butcher had plung'd his knife, quite up to the handle, into one of their eyes: which Wepfer "suppos'd, without doubt, to have "happen'd in consequence of the carotid arteries being cut through near to "the infundibulum, all the ventricles remaining sound:" although, if he had dissected the heads of the creatures slain in this manner, as it was natural to do, he would, perhaps, have found one of the ventricles wounded in some of them.

And as to wounds of the eye itself by which the humours are discharg'd, if the aqueous only be effus'd indeed, and no part is prick'd or incis'd but the cornea tunica; Aristotle (a), Celsus (b), and Pliny (c), had declar'd that there was reason to hope for a happy cure, from the examples of swallows, of pigeons, of doves, of green lizards, and of weazels likewise, before the followers of Galen confirm'd it in men, and in other animals also, after the observation of Galen (d) on a boy.

But when the vitreous humour, and still more when the chrystalline, is effus'd, can the eye see properly as before? This is what those believe with difficulty who, extracting these humours through the cornea, have observ'd that the iris and corpus ciliare are injur'd; though the entire state of both these parts is necessary to make vision perfect: not to say any thing of the retina, without which we cannot see at all, and which, when the vitreous humour is taken away, collapses into itself, or at least is corrugated.

Yet suppose that the aqueous humour, being again collected in its proper situation, is also collected in some of the remaining cells of the vitreous humour, and that thereby these cells, and any thing that was compress'd within them, are distended, and the retina consequently unfolded to its full extent; will the chrystalline humour, which had fall'n out by a wound improperly made, together with the vitreous, be generated afresh? this humour, the want of which is never supplied after being depress'd by a skilful surgeon, and which is so extremely necessary to vision, as they who have had it depress'd very well know?

And, indeed, it appears from that scholium of Elfsenerus (e), that those who made no doubt of the vitreous humour being restor'd, unanimously despair'd of the restitution of the chrystalline: yet in this scholium he takes notice of one who was suppos'd to have restor'd all the humours of the eye, after being press'd out, and vision itself to its perfect and natural state; and produces a certain testimony of Thomas Bartholin, of the same experiment of Burrhus; which he would not have produc'd if he could then have read what the same author Bartholin (f) said a few years afterwards; not in private letters, or in a brief manner, but in a public writing and at large; of the success of one experiment of this kind, and no more, which he had seen; and that a doubtful and imperfect success.

Nor, indeed, has the surgeon Scriverius (g); he who, in writing to Bartholin of the humours of the eye being press'd out by Burrhus, and by him-

(z) Exerc. de loc. aff. in Apopl.

(a) Hist. Animal. l. 6. c. 5.

(b) De Medic. l. 6. c. 6. n. 39.

(c) Nat. Hist. l. 29. c. ult.

(d) De Sympt. Caus. l. 1. c. 2.

(e) Ad Obs. 12. Dec. 1. A. 1. Eph. N. C.

(f) Aët. Med. Hafn. A. 1672. Obs. 132.

(g) Ibid Obs. 133.

self also, in a goose, and restor'd, denied "that it was doubtful to him
 "whether the same thing happen'd in all other flying creatures;" affirm'd
 that sight was perfectly restor'd, but "in part, and not with equal success,"
 either in the goose, or in the cock and the hen on which he made the expe-
 riment.

Yet, in the last-mention'd creature, he says that the chrystalline humour
 had been regenerated within eight weeks; but that it had not then come
 to its proper size: and notwithstanding he adds, "If the creature had been
 "still preserv'd for some weeks longer, there is no doubt but it might have
 been perfectly restor'd," yet he leaves the readers in doubt; as he did not
 afterwards repeat the experiment, which was of so easy a kind, in order to
 continue it for a longer time.

And even Zambeccarius (*b*), having formerly affirm'd, that as the rege-
 neration of the aqueous humour is (which he confesses) the mere work of
 nature, so "the regeneration and restitution of the vitreous and chrystalline
 "humour" is the work of the same nature also; "but what happen'd from
 "a regeneration of this kind he would tell us at another time;" never pub-
 lish'd any thing afterwards upon this subject, that I know of, although he
 liv'd for a very long time.

And I even know that he answer'd the enquiries of Sancaassanus, who wrote
 to him on that subject in the year 1724, by saying that, since the time he
 had written these things, he had not found opportunity to make the expe-
 riment: yet he believ'd that these two humours may be generated afresh,
 but more slowly than the aqueous: and he believ'd this, not only because
 it was certain from Benevoli, that where the chrystalline humour had been
 depress'd with a needle, on account of its opacity, in them the vitreous hu-
 mour came forwards to supply its place; but also because these two humours
 are nourish'd, and nutrition is generation; wherefore, as they were nourish'd,
 so they may again be generated. And this I have quoted, that you may
 perceive what might have been expected from him.

Finally, Theodorus Kerckringius (*i*) having expressly affirm'd, that he
 "would make an incision into the eye of any animal whatever that should
 "be offer'd to him, press out all the humours, and even give them
 "to the spectators to be taken away, and in a little time restore the sight
 "entirely: and that this he had done sometimes so far, for the sake of ex-
 "periment, that in one and the same dog he cut into one and the same eye
 "three times, and three times made a cure of it:" I ask of you, if, when
 all the humours were really press'd out, the sight was really *entirely* restor'd;
 I ask, I say, of you, what you suppose the reason to be, why, although other
 transactions of that industrious anatomist are still taken notice of, this one
 very great thing alone has been so buried in silence for a long time past, that
 the memory of it has been in a measure lost, and no mention made of it
 now, even by the most learned men, in recounting the experiments of others
 that relate to this subject?

41. But to wounds of the nose belong some of those surprizing cases
 which are suppos'd to have related to the brain; as that which it is said in
 Wepfer (*k*), was inflicted upon a Polish knight, by an arrow being driven

(*b*) *Experim. circa diversa e viv. erect. Viscera.*

(*k*) *Exercit. supra ad n. 40. cit.*

(*i*) *Spicileg. Anat. Obs. 100.*

from

from one side of the head to the other in such a manner, as to stand out equally on both sides. For as it was forc'd in "below the temple bones, "towards the prominence of the ossa jugalia on each side;" and as the knight, "besides the symptomatic fever, had scarcely any more violent "symptoms, than what generally attend wounded patients of every kind;" to me, I confess, the arrow seems to have pass'd not only below the basis of the cranium, but through the cavities of the maxillary sinusses, and of the nose.

And I suppose that wound also, which Freind (*l*) gives the account of from Procopius, to have related to the sinusses which belong to the cavity of the nose, in like manner; though to different sinusses from the former. For "the iron point of the arrow, entering above the right eye, near to the "nasal bone, however large and long it was, sunk in so deep as to be quite "out of sight," and continu'd there many years without creating any pain or uneasiness; I suppose of such a kind as show'd the arrow's point to have been situated in a more noble part.

For the frontal sinus excepted, and the neighbouring ethmoidæal and sphenoidæal sinusses, it might have room enough, especially in a large head, where it could lie hid, without any injury to the more noble parts; although it equal'd the little finger in length, and indeed almost in thickness. So also when Hildanus (*m*) very properly explain'd how it happen'd, that a wound beginning under the eye, and ending in the opposite and upper region of the neck was not mortal; and suppos'd the first part of the passage of the wounding instrument, to have been through the maxillary sinus; this wound in like manner, in that respect at least, belong'd to the nose.

And I even saw a wound of this kind at Bologna, which was of itself large, but to appearance extremely large: as therein were concern'd not only both these sinusses, the external nose, and the bones which lay beneath, but it had even laid open their cavities, and smear'd them over with blood; so that the natural deepness of these cavities, being added to the great opening of the wound thus inflicted, offer'd a horrible spectacle to the eye.

For an iron tube, which in our language we call *archibuso* (a little musket or hand-gun) having burst into pieces, in consequence of being overcharg'd with powder, it took away from the face of a boy his nose, and so much of both the maxillary bones, that both the maxillary sinusses, together with the cavities of the nose, were laid open; which appear'd so much the larger also, for this reason, that part of both those bones, which are interpos'd betwixt the nose and the mouth, was partly consum'd anteriorly, and hung down partly, in consequence of being broken; so that it was necessary to put a tube of lead betwixt them and the lower jaw, by which the boy might breathe and be nourish'd, till the broken part became whole, and the several dressings could be wholly remov'd from the cavities of the nose.

This boy was preserv'd by the diligence of Paul Piella, a very experienced physician and surgeon: whom I saw to be at first struck with horror, as well as the others who stood around him, and to turn away from so unusual and miserable a spectacle, when his bloody face was uncover'd on being

(*l*) Hist. Medic. ad A. 560.

(*m*) Cent. 4. Obs. Chir. 2.

brought into the hospital, immediately after receiving the wound; so large and so deep did it appear at first sight; though soon after, by examining it more attentively, and by comparing it with the natural structure and disposition of the parts, as known from anatomy, we perceiv'd it to be very considerable indeed, and large, but to be much less deep in reality, than it was in appearance.

42. And I remember this of a wounded lip. Another boy of almost the same age; that is to say, of twelve years of age, but of a most noble family; having fall'n on his face in running, and broken one of his upper dentes incisorii transversely against the marble pavement, his upper lip was cut through by that part of the tooth which had been broken off. And now, by the attention and care of the surgeons, that part of the lip which lay about the wound had decreas'd in its swelling, and become softer: yet neither orifice of the wound inclin'd to agglutination; nay, a very flaccid and moist flesh, which lay in the wound, was an absolute bar to such a disposition.

We suspected that something extraneous was lodg'd within: but what really did lodge therein never enter'd into any one's thoughts, since not only the patient, but all the domestics, had believ'd, themselves, for a certainty, and had affirm'd it to me and to the surgeons, from the very beginning of our attendance, that the part of the tooth which had been broken off, as it had made the external orifice of the wound, had also fall'n out at that orifice.

Yet that very part of the tooth was, in fact, buried within the wound: and this being easily extracted, the wound was in a little time, and without any difficulty, brought to a cicatrix. And from hence you will learn, that, in examinations of this kind, we must not pay a regard to the narration of any one, (even when the most probable) unless of those who assert that they clearly saw the circumstance with their own eyes.

43. And I could wish, that as this boy afterwards grew to be a young man, and now flourishes among the nobles of his famous city; so another also, born in a place not inferior, had not, after having recover'd from his wound also, been snatch'd from a very noble family, by a much more grievous kind of disorder. This boy was three years old, when, being at play, he fell down, and dashing his chin against a marble step, so compress'd his tongue (which happen'd at that time to be thrust out) betwixt his teeth, as to cut it; and with an oblique wound, at least an inch in length: nor at a much less distance from the lower point of the apex, divided that anterior part of the tongue from the other entirely, for as large a tract as from the edge laterally to the middle line.

The parents of the child, and all the relations, were very much affected with the misfortune, and enquir'd of me by letter; but particularly a great-uncle of the child, who was a man eminent for his learning; not by what kind of remedy he could now be cur'd; for by reason of his age he was obstinately repugnant to all kinds of remedies, and shut his teeth against every thing; and to compel him, by violence, to submit to any method of cure was improper, by reason of the fever, and the tumour of the tongue; both of which had come on: but this one thing they enquir'd, which was the only one that remain'd for their comfort, whether there was any hope that, if he were left to the care of nature alone, he might speak properly and expeditiously.

I imme-

I immediately wrote back that they need not despair; and produc'd many examples to that effect: especially a case very similar thereto, which is extant in Hildanus (n). The event also, by the blessing of God, was very similar: so that I heard, when I happen'd to be at Venice in the following year, that "the speech" of the child, to use the very words of Hildanus, "was not at all deprav'd;" nor was it injur'd through the whole of his life-time, which was but short; for he was soon after carried off by a malignant kind of small-pox.

And what you will think still more surprizing, although he spoke properly and expeditiously, yet those parts of the tongue which had been disjoin'd by the wound, were not coalesc'd to each other, but each of them had its own proper cicatrix: for which reason that anterior part was seen, even at this time, just as immediately after the wound, to be disjoin'd from the other, and pendulous. Thus far of wounds of the head. Farewel.

LETTER the FIFTY-THIRD

Treats of Wounds and Blows of the Neck, Breast, and Back.

1. **A**LTHOUGH in this third section (a), in which alone the author of the Sepulchretum would have blows and wounds of all the parts comprehended, some things are now and then repeated; as, for instance, the first article of the twentieth observation, in the first article of the twenty-second; and the fourth article of the twenty-first, in the eighth article of the same, and in the fifth article betwixt the seventh and eighth; and what is in the scholium to article the first of the twenty-fourth observation, in the scholium to article the fourth of the same observation; and although you will now and then think the disposition and order of the matters is somewhat deficient; yet there is much more irregularity in the additamenta which are join'd to this section. For besides that the twenty-sixth observation, which has no relation to blows or wounds, is thrust in here, and takes up, together with its scholia, ten large pages; and besides that under article the first of the tenth observation, and in observations the twentieth and twenty-first, the same histories of Parey and Bartholin are again produc'd, which had been already given above in this very section, under observation the twenty-third, article the seventeenth, and fourth, and under observation the twenty-sixth, article the eighth; besides these things, I say, without any the least

(n) Cent. 1. Obs. Chir. 28.

(a) l. 4.

regard being had to order, they pass over from a wound of the breast to a wound of the tibia; and among the wounds of the breast, both wounds of the head and belly are indiscriminately interpos'd.

I, however, am determin'd not to repeat any thing in these letters, and to preserve order and regularity. Wherefore, as I wrote last of wounds, and blows of the head, I shall now treat of the wounds of the neighbouring parts, neck, breast, and back. And because the observations made by Valsalva, and by me, are not so numerous as to exceed the bounds of one letter; I will, according to my custom, propose both of them in the present, and begin with his observations.

2. A woman, of fifty years of age, being wounded, with a cutting instrument, in the neck, fell down; and could no longer move her hands or feet. After some days, she mov'd her hands again, but not with their former vigour. A slight delirium came on; and, finally, before the seventh day she died.

As the body was buried privately, the opinion, of the spinal marrow being injur'd, could not be confirm'd by dissection. Yet this seem'd so probable from the paralysis of the limbs, from the seat of the wound, and from the small fragments of bone which had come out therefrom, that I did not think this observation ought to be entirely omitted here.

3. A man, of five-and-thirty years of age, of a bilious temperament, being, in the month of November, in the year 1688, wounded, with a knife, at the middle of the sternum, betwixt the fifth and sixth rib, was immediately seiz'd with a great loss of strength; so that, as the pulse could scarcely be perceiv'd, the physicians thought he would die in a very short time. Yet, after three hours had pass'd, his strength began to return by degrees: he was therefore brought into the hospital of St. Mary de Vita. On the following day he was troubled with a terrible cough, and with a diarrhœa also. But the latter was very urgent, although scarcely any thing besides a little viscid matter, was discharg'd thereby: and on the sixth day it ceas'd.

Yet the cough was so encreas'd every day, that it could scarcely be borne. From the first days also, there was a sense of a very great weight in the belly, which, in the progress of the disorder, extended itself through the whole abdomen: there was none, however, in the thorax. On the first days, also, the pulse was something turgid, and moderately quick; which quickness it even preserv'd afterwards: but growing smaller and smaller every day, it at length fail'd gradually on the eighth day, together with life.

In the body, at the first incision on the right side of the sternum, the blood, wherewith that cavity of the thorax was fill'd, rush'd forth with great impetus. And when the sternum was taken away, and the blood exhausted with sponges, fresh blood again flow'd through the diaphragm, which was wounded, from the belly, into the same cavity of the thorax.

For this reason, it was necessary to open the belly also immediately, and to exhaust the blood, which was extravasated into that cavity: the concremented fibres of which blood, being dispos'd throughout the external coat of the intestines, in the form of a net, adher'd to this coat in such a manner, that they could be separated by the knife only. Wherefore, when all the blood

was remov'd, and the viscera brought into view, we return'd to examine the wound. The mediastinum, which was the first part that corresponded to the wound, was wounded: after that the pericardium: and, finally, the paries of the right ventricle of the heart, so that the fissure of the wound open'd within that ventricle; and when the ventricle was compress'd, a little blood was discharg'd from it through the fissure. But the next to the wound of the mediastinum was the wound of the diaphragm; through which blood, as has been said above, flow'd out of one cavity into the other.

4. Since the time in which Galen (*b*) said, that if a wound penetrates to the ventricle of the heart, "the man must immediatly die;" and if it did not penetrate, "that some might not only live through the day, on which they were wounded, but also through the following night;" dissections of dead bodies have shewn, that the contrary frequently happens: many of which, indeed, you have in the Sepulchretum, but not all. For there are some extant which may be added, and not only from books that have been publish'd since; as, for instance, those that are produc'd in more than one volume of the Royal Academy of Sciences at Paris (*c*); but also much more ancient ones, as that which was made by our Falloppius (*d*): from whence it appears, that whether a wound, as in this observation of Falloppius, does not penetrate through the parietes of the ventricle, or, as in the former, reaches quite into that cavity, life may be sometimes prolong'd to a greater length of time than the more ancient authors suppos'd.

The observation of Valsalva, when compar'd with the others, is not in the number of those, wherein life was dragg'd on to the greatest length of time; nor yet in the number of those, wherein it continu'd the shortest time. But it contains, in respect to the wound of the diaphragm, where-with the other was complicated, some things worthy of remark; from whence physicians may draw some advantage in forming a diagnosis.

For when there are signs of the heart being wounded, and of the blood being pour'd out therefrom, if there be no sense of weight in the thorax, and there not only is such a sensation in the belly, but it is increas'd every day, there will be room for a conjecture of the diaphragm being so wounded, as to transmit blood from the thorax into the belly, especially, where some one of the symptoms which confirm this septum to be wounded, is not wanting: of which kind was that very troublesome cough in the patient in question, that was so violent as scarcely to be borne. Which symptom, although omitted by some, is at least not pass'd over by that excellent surgeon Falloppius (*e*).

Do not, however, be surpris'd, that it is not taken notice of in the next observation. For all the symptoms of any disorder do not always occur; on which account, that will have other things, which we do not read of in this observation. Besides, observers frequently make remarks only upon the principal symptoms.

(*b*) De Loc. aff. l. 5. c. 2.

(*c*) Hist. A. 1735. Obs. Anat. 9. & A. 1744. Obs. Anat. 9. &c.

(*d*) Tract. de Vulnerib. c. 28.

(*e*) eod. c. 28.

Finally, in proportion to the various state, or situation, of the wound in the same part, different symptoms will offer themselves at different times. And although in this, and the following observation, we may, in some measure, conjecture what was the seat of the wound; from the other circumstances that are added; yet it were to be wish'd, that in describing this seat, and even the whole passage of the wound, nothing had been pass'd over by Valsalva, which could be wish'd for by any one: and even that, in the beginning of this first history, he had expressly said what he seems to have intended; I mean, that the knife was so drawn in betwixt the fifth and sixth rib, as to ascend towards the middle of the sternum.

5. An old man, of seventy years of age, who had been blind about twenty years, fell down, and dash'd the left side of his chest against a flint with such violence as to break his ribs. He was receiv'd into the same hospital. His pulse was hard; he had an oppressive and pricking pain in the wounded part; his respiration was very difficult. And although this difficulty began to remit a little about the fourth day; yet, on the beginning of the sixth day, it again became more violent; and with it a delirium came on. All those symptoms continuing, the patient died about the ninth day.

The left cavity of the thorax was full of extravasated blood: and the true ribs, of the same side, except the uppermost, were all broken in such a manner, that the seventh had wounded the diaphragm by its rough and unequal fracture; and this muscle was universally inflam'd round about the wound.

As to the blindness; in what manner Valsalva found both the chrystalline humours to be affected, I have written in the eighteenth of the *Epistolæ Anatomicæ* (f).

6. Here you have another example of the diaphragm being wounded, and of blood being effus'd internally. But there is no mention made of a cough, or of a weight in the belly; only of an oppressive and pricking pain in the thorax, of a very difficult respiration, and a delirium. Suppose the wound, in this case, not to have been in the tendinous part of the diaphragm, but, as is most probable, in the fleshy; and that it did not open into the belly, so as to be capable of transmitting thither the blood effus'd from the intercostal vessels, which were broken asunder, together with the ribs, but to have consisted in the upper fleshy fasciculi being prick'd and lacerated, every now and then, by the rough points of the broken rib, and for that reason to have been inflam'd; and you will readily conceive from whence all the differences betwixt this and the former observations arose.

And although, in the six broken ribs on the left side, and in the blood which fill'd that cavity of the thorax, there are sufficient causes of a difficult respiration; yet if you observe that this respiration became more difficult when a delirium was added to it; that is, according to the opinion of the ancient masters, when to a wound of the diaphragm an inflammation was added; you will enumerate among those causes, and on this account, an injury of the diaphragm also.

For we are not to suppose, that they were always deceiv'd, when they allow'd of a paraphrenitis in the inflammation of this part; although I have shown you formerly (*g*), that these two disorders are not necessarily join'd together. Nor does the risus sardonius always arise from a wound of the diaphragm: which is not only demonstrated by other observations, but by the two just now propos'd. And yet that this was not falsely asserted in Aristotle (*h*), may be understood from Hippocrates (*i*), from whom Vallesius suppos'd him to have taken it (*k*). And this is confirm'd by Pliny (*l*), from "the shows of the gladiators," which were very frequent at Rome. In looking over a passage of which author at any time, I have not been so much surpriz'd, that, following Celsus (*m*), he has asserted the diaphragm to be a membrane, which "has no flesh, but a slender nervous substance;" as that a note has been hastily added by Dalechampius, and, as I suppose, not read over again, wherein he says: "Anatomy shows this to be false; the circumference of the septum, indeed, is nervous and membranous, yet the middle part of it is fleshy."

But I return to my subject. Whether you consider that similitude of laughing in the convulsive concussions of the diaphragm, as Hippocrates seems to have done, who call'd this laugh *tumultuous*; or even in the face, as most persons generally do; and amongst these Bartholin (*n*), who confirms the thing by an example which he refers to in his *Saxon*, and explains it by the phrenic nerves, with less perspicuity than that very exact anatomist Meckel (*o*) has done lately; the small branches of the cervical, from whence they arise, being produc'd through the face; whether you consider it, therefore, in one or the other way, or in both of them, as this laughter is not a mere supposition; because it does not occur in all wounds of the diaphragm; so neither is the delirium a mere figment, though it does not attend all inflammations of the diaphragm.

Yet, if you chuse to have no regard to ancient observation, you, nevertheless, cannot deny that the diaphragm, which is the principal instrument we use in respiration, when it is not only wounded, but inflam'd also, and depriv'd in part of its support, by reason of the fracture of the seventh rib, is chiefly to be reckon'd among the causes of that very difficult respiration.

7. A man, about forty years of age, who had labour'd a long time under a lues venerea, with very violent pains in his joints, and a difficulty of breathing, particularly when ascending any height, having fall'n upon the ground from a very high place; that is to say, a place to which he had ascended by a ladder of forty rounds; at first, indeed, cried out for assistance, but soon after could speak no more, and was carried off by a sudden death.

In the belly, and the head, was nothing worthy of remark, or preternatural. But when the thorax was open'd, all the cavity of the pericardium

(*g*) Epist. 7. n. 14.

(*h*) De Part. Animal. 1. 3. c. 10.

(*i*) Epid. 1. 5. n. 34. apud Marinell.

(*k*) Comment. in hunc locum n. ipsi 94.

(*l*) Nat. Hist. 1. 11. c. 37.

(*m*) De Medic. 1. 4. c. 1.

(*n*) Anat. quart. renov. 1. 2. c. 3.

(*o*) Hist. de l'Acad. R. des Sc. de Berlin, A. 1752.

was found to be full of concreted blood; which seem'd to have burst forth from the great artery near to the heart. For the probe being pass'd thither from without, was seen to come within the cavity thereof.

8. Valsalva himself knew a vein to have been ruptur'd in the belly by a fall from on high, as I shall write to you hereafter (*p*). Why then, in this man, if a vessel must have been ruptur'd in the thorax from a similar cause, did not this rupture happen rather to a vein than to a vessel furnish'd with very thick coats, such as the trunk of the great artery is, especially near the heart? Let us suppose that the man had been, from the lues venerea, subject to a difficulty of breathing, and that the great artery was not found to be ruptur'd, but pierc'd through, as it seems to have been, with a small, and perhaps oblique foramen.

Thus you, who bear in mind what I have said (when treating of sudden death from the disease of the blood-vessels (*q*)) of the disorders of that artery perforating the coats by degrees, and opening a discharge for the blood, even within the pericardium; thus you, I say, will easily imagine what might have preceded in this man, from whence the trunk of the artery, being injur'd in that part, not only brought on a difficulty of breathing, by not sufficiently propelling the blood; but, finally, by pouring out the blood, in consequence of a fall of this kind having broken through any barrier that might still remain in the external coat, brought on a sudden death. And this injury would have been observ'd without difficulty, in my opinion, if Valsalva had inspected the internal surface of the artery.

But be this as it will, it is certain that the disorder which he found in the heart of that old man whose history I shall immediately describe to you, had existed for a long time before; as is evident from the nature of the disorder itself.

9. An old man, of seventy years of age, fell from a high place, and dash'd the right side of his thorax against the ground. Being brought into the same hospital which I have mention'd above, he was seiz'd with so great a difficulty of respiration, and so acute a fever, that he died on the seventh day.

In the right cavity of the thorax, the lungs had grown somewhat hard; the lobe being universally affected with a great inflammation; especially at the upper part, where it also adher'd closely to the pleura, and contain'd an abscess. The left lobe of the lungs was likewise of a red colour, but more on the back-part, so as to seem somewhat inflam'd; and had black spots, lying at a distance from each other, through its substance. The pericardium contain'd a great quantity of water, and so large a heart as almost to equal that of an ox in its size. In the ventricles of the heart were polypous concretions of a white colour, and pretty soft, one in each; but that which was in the right ventricle was the largest.

10. I do not doubt but, if it had been enquir'd to what disagreeable symptoms this old man had been subject before his fall, there would have been some found which might have been ascrib'd to that very increas'd size

of the heart. And although there was sufficient cause, in the violent injury from the fall, why the right lobe of the lungs should contract an inflammation and an abscess from the degeneracy thereof into suppuration; yet it is not altogether improbable, that this inflammation was the sooner contracted, because the lungs had been before compress'd by a heart of that kind, and relax'd by reason of the less quick passage of the blood through the heart, and consequently through themselves also; and were dispos'd, upon the accession of any new cause whatever, to retain this blood, and less fit to prevent the effects that follow'd therefrom.

11. Now, as we have given you histories of blows and wounds which relate to the neck, the breast, and the sides, from the papers of Valsalva; let us subjoin four observations of his which relate to wounds of the back.

12. A man, about five-and-forty years of age, was wounded with a sharp-pointed instrument in the back, about the fifth and sixth rib, at the distance of two inches from the spine. On the first days only a small quantity of blood distill'd from the wound; but afterwards, about four or five ounces were discharg'd every day. This hæmorrhage being restrain'd about the tenth day, by means of various remedies, the wound swell'd, and began to discharge a great quantity of sanies; the quantity of which was increas'd every day. The sanies was viscid and tenacious, so as to suffer itself to be drawn out into a long extent. This excretion continu'd a long time, and was join'd with a slow fever; so that the patient sank gradually, and death came on at the forty-second day from the infliction of the wound.

On dissecting the body, it was found that neither the wound nor the sanies had penetrated into the cavity of the thorax: and although the sanies had form'd, to itself, many sinusses and winding communications; yet that all the mischief had been confin'd to the external parts.

13. How much better it is to moderate and check gently, than restrain, not only other hæmorrhages, but those of wounds also, is confirm'd to you by this history. And you will be able to gather some useful admonition from the following.

14. A husbandman, about thirty years of age, of a bilious temperament, being wounded with a cutting instrument in the left scapula, and quite to the second rib, so as to make a large wound, was receiv'd into the same hospital that has been mention'd above. Being there under the care of Paul Piella, a very excellent physician and surgeon, he was seiz'd with a spitting of blood, a cough, a difficult respiration, had a weak and frequent pulse, being often attended with swoonings; and as all these symptoms grew stronger and stronger upon him, it seem'd that he was very likely to die about the ninth day.

But this day being pass'd over, and the symptoms remitting in some degree, the wound itself also inclin'd to be in a better state; when, near the seventeenth day, the wound swell'd on a sudden, although without inflammation, and a fever came on in a violent degree, with a languid pulse, and a rigor diffus'd through the whole body, a sense of weight in the thorax, a laborious respiration, and purulent urine; and death at length succeeded twenty-six days after the patient had receiv'd the wound.

The dissection of the thorax was perform'd in conjunction with Peter Molinelli,

pass'd betwixt the muscles that lie near the spine, did not, however, appear to have perforated this membrane. As to the lungs, they abounded with tubercles in many places, some of which were larger, and some smaller: and many of them were already suppurated, and when cut into discharg'd a sanies; but others still preserv'd the similitude of a sound and uninjur'd gland. In the pericardium was a little serum. In each of the ventricles of the heart was a polypous concretion, which were both of them produc'd from thence into the auricles and annex'd veins; that in the right being pretty large, and that in the left but small.

17. This young man, also; if some internal convulsion, to which the pain about the stomach, the distension of the intestines from retain'd air, and the icteric colour of the whole body may be imputed, had not happen'd to be added to the other bad symptoms, and to have brought on a more speedy death; would, certainly, have expectorated blood and pus, upon the rupture of these tubercles in the lungs: and it would have been thought, that this expectoration must be owing to the wound penetrating into the cavity of the thorax. But whether pus, taken up from the deep wound into the sanguiferous vessels, (as I have said, lately (*r*), happen'd from wounds of the cerebrum) and carried into the lungs, excited those tubercles; or whether they had begun to exist of themselves before the wound was inflicted; I leave entirely undetermin'd.

18. Another young man receiv'd a wound in the left part of his back; which passing downwards obliquely, and to the right side, and grazing upon the vertebræ, at length enter'd the right cavity of the thorax betwixt the sixth and seventh rib. For some days after receiving the wound, the patient suffer'd a slight difficulty of breathing, and a kind of pain, which corresponded thereto, in the anterior part of the body: he felt a pain, likewise, when he turn'd himself from one side to the other. He was also troubled with a kind of itching, sometimes in one place, and sometimes in another. To these symptoms was added, on the fifth day, a cough, with a spitting of blood; and after that a kind of stupor in the lower limbs. This stupor was succeeded by a paralysis, from the middle of the body quite to the extremities of the feet; so that the power of moving and feeling remain'd only in the thorax and the parts above. He was at the same time attack'd with a tumour and tension of the abdomen, and a suppression both of the urine and the intestinal fæces. After the coming on of this palsy, the patient seem'd to himself to be something better. Yet he was sometimes seiz'd with swoonings; in one of which he died on the beginning of the eighth day.

While the body was mov'd, a great quantity of blood burst forth from the wound: which enter'd the cavity of the thorax on the right side, betwixt the two ribs that I have mention'd, near to the vertebræ; so as to make it seem natural to suppose, that this great quantity of blood must have proceeded from a laceration of the intercostal vessels. The right lobe of the lungs show'd no peculiar mark of injury in the part which corresponded to the wound; or, at least, none that came under the cognizance of the senses, ex-

linelli, and Francesco Guiccardini, assistant-physician of this hospital. The knife, in cutting out the sternum, having necessarily penetrated into the right cavity of the thorax, a great quantity of fluid rush'd out, not very much unlike the serum of milk; and in this fluid the lungs swam. This fluid being exhausted, a sinuous cavity was found in this lobe, full of purulent matter, and communicating with that cavity of the thorax by a large aperture.

But the other, that is, the left cavity of the thorax, which, as has been already hinted, corresponded to the wound, contain'd no purulent matter, and had its lungs entirely uninjur'd and sound. That part of the pleura, indeed, which was nearest to the wound, was of a livid hue; but had not the least foramen: nor was the wound, though examin'd to the bottom, and with the utmost care, found to have reach'd beyond that second rib in its direction inwards.

15. The symptoms which, while you were reading the history of the disease, you would suppose to have been from the wound penetrating into the cavity of the thorax, you perceive, by reading the dissection, were from the inflammation of the lungs, their suppuration, and an empyema which had follow'd this suppuration. Wherefore, as in other patients, so in wounded patients also, all the symptoms are not always to be imputed to the first and evident disease; but we are to suppose that another may be join'd thereto, which does not depend thereon: and even when the symptoms seem to be from the first disease, we must suspect, and enquire with diligence, whether they may not rather be from some other disorder join'd to the original one, as, in this case, from the marks of inflammation, which, perhaps, did exist in some degree; and these not such as related to the left lobe of the lungs, which was the side whereon the wound had been receiv'd, but to the right lobe.

16. A young man, of twenty years of age, was wounded with a knife almost in the middle of the back; yet with this circumstance, that the wound, inclining somewhat to the left side, tended towards the beginning of the sixth and seventh rib. Not long after the wound was inflicted, a fever came on; and to this was added, after some days, a slight difficulty of breathing; a slight, also, and dry cough; but a great pain about the stomach, and a considerable tumour of the whole abdomen. At length, the respiration growing more difficult, the patient died near the sixteenth day, the whole body having an icteric appearance.

When the belly was open'd, the intestines were seen to be turgid with air; but the liver was in a natural state.

On opening the thorax, a little serum was found in the lower part of both its cavities. And as the left lobe of the lungs adher'd strongly to the pleura, the membranous productions, whereby they were tied with the upper and anterior part of this membrane, seem'd to be moist, as it were, with sanies: and that seem'd, in like manner, to be a peculiar adhesion, where the same lobe of the lungs was join'd to the pleura, in the part corresponding to the wound, in such a manner, that it could not be separated without laceration.

But the wound, although it reach'd quite to the pleura itself, after having pass'd

itself, by means of a red-hot iron, this restraint was brought about, till the crust fell off; as you have it in Bohn (*u*): from whom not only this, but many other observations, which relate peculiarly to the bodies of those who died of wounds, might be added to the Sepulchretum.

And the experiments which I have related to you in the nineteenth letter; and which show, that if the carotid arteries, or internal jugular veins. are tied up with a ligature, what they formerly fear'd did not soon happen; may encourage the surgeon to tie up one, or the other, of these vessels in one side, that the flux of blood may be restrain'd for some time. But it is evident, that the vessels cannot be constricted, and stopp'd up, for a very long time, by other methods, any more than by those which bring on a crust; nor can we, with any good grounds, hope, that after the ligature's being applied, those bad symptoms will not sooner or later come on; which, at length, of themselves bring on death: although, in applying these ligatures, no error or omission whatever was made by the surgeon.

For as both these trunks of vessels are wrapp'd up within a kind of membranous; or, if you please, rather within a kind of cellular sheath, together with the nerves from the par vagum, and intercostals; it is very difficult, in a deep place, and one that is cover'd by the flowing blood, to tie up either of them in such a manner, that one, or other, or both, of those nerves may not be tied up at the same time, or may not be hurt by passing the needle beneath the vessels.

Nor, if the artery is to be tied up; is it sufficient to constringe the artery, by putting a ligature below the wound, as those experiments which I just now took notice of show; but there is a necessity for applying another above the wound. Nor can the compression which is made use of in the limbs, by means of a bandage call'd *torcular*, or tourniquet, take place in the neck; either to diminish the impetus of the blood into the constricted artery, or to intercept the flux while the surgeon is acting his part. For we are not only forbid to apply this compression to the neck by the aspera arteria, but also by the other vessels, which must not, by any means, be compress'd.

And although you should think of any thing to interpose betwixt that bandage and other certain parts of the neck, and particularly the part which is to be compress'd, so that their prominence may prevent the bandage from touching those parts which are not to be compress'd; yet how can that which is most to be press'd upon, be compress'd so as to prevent the vein also, and nerves; which we have said are carried together with the artery that is to be compress'd; from being compress'd therewith.

From these things, therefore, you perceive the very great difficulty of the affair. And from what has been said above; you sufficiently perceive, if it is difficult to tie up a trunk in such a manner, as not to injure any part that lies near it, while the business is to be transacted in a deep place, which is, at the same time, overflowing with blood; you sufficiently, I say, perceive, how much more difficult it is to tie up any neighbouring branch,

cept that the external coat was eroded in some places: yet the whole of this lobe was of a red colour, and tumid. The pericardium was full of serum. From the heart, when cut into, a frothy and fluid blood burst out; and in the right ventricle thereof was found a polypous concretion.

When the belly was open'd, all the intestines were turgid with air; and in them was a certain fluid ting'd with a black colour. The bladder was fill'd with urine. In the cavity of the belly were some pints of stagnant serum.

19. As Valsalva has, with propriety, accounted for that effusion of blood, from the intercostal vessels being lacerated, or eroded; so you, perhaps, would not err, if you were to ascribe the paralysis to a pricking or irritation of their attendant nerve from acrid sanies. For from the former a convulsion would arise, and from the latter a constriction: and from hence, as I have already explain'd (*s*), so much more considerable a resolution might happen, as every costal nerve is connected to that very long nerve which they call the intercostal. And you have a proof of the costal nerve being punctur'd, from that corresponding pain in the anterior part of the body, to which this nerve goes. However, notwithstanding upon these suppositions it is not difficult to explain this history; yet, if any better mode of explication occurs to your mind, I shall with cheerfulness assent thereto.

20. Thus far go the observations of Valsalva; now take mine: which I shall adjoin in the same order; although in regard to the two which relate to wounds of the neck, as one has been already sent to you in a former letter (*t*), there is no reason to repeat it again here; and the other is extremely short.

21. A man had his neck pierc'd through, in the inferior and anterior part, in such a manner that the foramen which had been made by the entrance of the sword, was scarcely more than an inch distant from the foramen which the sword had made on coming out. This man died very soon, like a suffocated person.

The body, although I dissected it at Venice, with a view to demonstrate to my entreating friends, many and various things which relate to the natural structure of the parts; yet at the same time confirm'd this supposition, that the man had died of suffocation. For one ring of the aspera arteria, having been divided from the other, had laid open a passage for the blood to be discharg'd, from the incis'd vessels, into this tube, and consequently into the lungs.

22. I remember that two enquiries were particularly made of me in regard to deep wounds of the neck. First, if any trunk or branch of the sanguiferous vessels, which is too large to be sufficiently constring'd by introducing arm'd doffils, or the like, be wounded, by what method can surgeons restrain the flux of blood? I answer'd, that it might be restrain'd by many methods, if the question was of preserving the patient for some time only; but if the question was of preserving him for a very long time, by scarcely any. For by generating a crust upon the internal jugular vein

without that danger; as, to the other difficulties, the slenderness of the vessel is added: which, if it does nothing else, at least greatly diminishes the power of distinguishing which of the many neighbouring branches is wounded, or in what part it is wounded.

And although this seems to be the natural state of the circumstances; yet as I am not ignorant that those methods may sometimes succeed, which we scarcely dare hope will succeed; I, for this reason, contracted my answer, so as to say, that this end could be scarcely brought about "by any means." Nor had I any reason to be sorry I had answer'd thus, when, some time after, I lit on the cure of a wound inflicted in the internal jugular vein, as related by the celebrated Schlitingius (*); whose success I wish all could attain to, as easily as they can imitate his hope.

23. But these things pass'd in private conferences. Another enquiry was made of me, by letters, in the year 1735. A young man, of twenty-four years of age, and of a good habit of body, receiv'd a wound from a quadrangular and sharp dagger, which pass'd obliquely downwards, from the left side of the neck, at three fingers breadths below the external ear, towards the beginning of the spinal marrow. Although scarcely any blood was discharg'd from the wound, yet the young man immediately fell down; being, in such a manner, depriv'd of the power of motion and feeling in all the parts which are below the head, that it was necessary to carry him home, and put him to bed: and there, having, among the few words which he spoke with a great difficulty of respiration, said, that he was cold, a warming-pan was immediately applied, with great indiscretion, to his thighs, his legs, and his feet, whereby he was very much burnt; though he himself did not at all feel these burnings, which at length degenerated into foul ulcers. At first he neither discharg'd urine nor stool; but after some days, he discharg'd his urine, not only in an involuntary manner, but even without his knowledge.

As he was diligently attended by a physician and surgeon; after the completion of the seventeenth day, the left side of his body first began to feel a little: and on the twentieth day, the fingers of the upper limb, and the toes of the lower limb, on the left side, both began to be mov'd in some measure: and betwixt that and the thirtieth day, both the powers were, by degrees, more and more encreas'd in the left side. As to the right side, however, which was the side opposite to the wound, sensation did not begin to return there till the thirty-second day; and soon after that, motion return'd also, and went on to encrease, by degrees, in the same manner.

And although, on the fortieth day, the whole body had pretty well recover'd its sense and motion; I say, pretty well, for he could not yet stand, and much less walk; and even although, on the twenty-sixth of May; whereas the wound had been inflicted on the second of February; the young man went out of his chamber, and with both his legs extenuated, and in a manner wither'd, walk'd slowly and gradually, just like a child who was learning to walk; yet even then, he us'd the right side of his body

(*) Aët. N. C. Tom. 8. Obs. 29.

with a more infirm motion than the left; and the latter had its sensation also the most perfect.

The cause of this difference then being ask'd of me; I hinted, that we must suppose it to consist in those medullary fibres, which, passing betwixt the right and left side of the beginning of the spinal marrow itself (*y*), may sometimes wholly, and, at other times, in great part, transfer the effect of the injury which had been done to this side, to the opposite. And although this explication has nothing peculiar in it; as it depends upon the explications of others, of a hemiplegia brought on by an injury of the brain in the opposite hemisphere; yet, as this history shows, how much lower still the seat of an injury, which produces the same effect, may be; it seem'd to me to be no despicable observation, and therefore worthy to be propos'd to you, among other wounds of the neck. But now let us go on to the wounds of the thorax itself.

24. A man had been wounded in one of his clavicles almost a month before, and the cure of the wound indeed seem'd to go on very well; when, at length, he began to be seiz'd with a stupor of the senses, and with rigors; to which there was by no means a corresponding heat. As he died with these symptoms, his body was brought into the college, that I might begin to teach anatomy from thence; it being now near the end of January, in the year 1732; till I should be furnish'd with a more proper subject.

The wound did not reach into the cavity of the thorax. But as I saw that the side opposite to the wound was green externally within two days after death, and no cause of this greenness appear'd within the thorax; I thought it was proper to look for it in the parietes: and pus was found betwixt the muscles of the sides and of the back. But there were abscesses also in other places; as, for instance, about the pyramidal muscles of the abdomen.

Yet was there no pus within the belly; only some part of the omentum, and intestines, were of a green colour. The liver indeed, the spleen, the stomach, and the bladder, were larger than their natural state requires. But there was no other appearance of disease besides this, either in these, or in the other viscera. Those parts where the pus had insinuated itself betwixt the muscles, were the only parts that appear'd to be actually vitiated.

25. From this history it also sufficiently appears, that pus may be receiv'd into the sanguiferous vessels, and transferr'd to another part. For if it were not carried by means of the sanguiferous vessels, how should it, of itself, have come betwixt the muscles, and not those that lie near to the cavicle, but those that are opposite, or at a great distance? Now give me leave to relate to you an observation of much greater moment, that is, an observation of the heart being wounded.

26. A poor man, a native of Milan, of forty years of age, being of a pretty muscular habit of body, and healthy; except that his limbs were here

and there cover'd with a filthy scabies; after having din'd, and drunk plentifully, fell into a quarrel with another man of his own sort, and receiv'd a wound with a knife, at the distance of two fingers breadths below the left pap. As but little blood was then or afterwards discharg'd, he walk'd, of himself, to about the length of seventy paces; after this he sat down, and throwing up from his stomach what he had taken at dinner-time, he died there within half an hour; or at least not much after that time: and this was about the fifteenth of March, in the year 1725.

The body being brought into the theatre of the college, in order that the anatomical demonstrations, which the celebrated John Baptist Vulpus exercis'd, at that time, in the second place, might be finish'd therefrom; it was examin'd with the greatest diligence by both of us. And many things were observ'd, indeed, which do not relate to this place; since here, in general, we only relate such things as appear'd to be more preternatural. And that I may just touch upon these things, before I write of the wound, they were briefly as follows:

In the belly, the spleen, which was, in other respects, sound, was somewhat larger in every dimension, than might seem to agree with the stature of a man who was square-built, and of a proper size; and even larger than seem'd to agree with the size of the liver. But, that there was little bile in the gall-bladder, I did not at all wonder; as I knew, that both a vomiting, and a copious dinner, whereby it had been press'd out, had preceded: and indeed, at the mouth of the biliary duct, and in that neighbourhood, the intestine duodenum was seen to be moist with yellow bile.

As to what relates to the head, the sanguiferous vessels were turgid, and without doubt, from the great number of air-bubbles wherewith they were distended; many of which bubbles we saw, here and there, in the vessels of the brain, and under the pia mater: being probably extricated from the blood, by reason of the warmth of the season; especially as the body had lain some time after death. For we did not come to the examination of the internal parts of the cranium, till the thirteenth day: at which time, taking out the brain, we observ'd that the cavity of the cranium was much larger towards the right side, than towards the left, in the occiput.

But the thorax, and the wound, which we examin'd on the first days, were in the state I am about to describe. The left cavity of the thorax had a great quantity of blood extravasated in; it and the pericardium also, which was fluid however; and such as was seen in other parts of this body, wherein it was, in general, more dissolv'd, and more watery, than usual; perhaps from the quantity of fluid which had been drunk, and which is soon carried through the chyloferous into the sanguiferous vessels. Yet the narrowness and obliquity of the wound were the obstacles, in my opinion, to this blood's being discharg'd at the external orifice.

By following the passage of the knife from this orifice, we found, that it had pass'd from that place which I have mention'd, betwixt rib and rib, obliquely upwards, and to the right side, to the mediastinum, the pericardium, and the anterior side of the left ventricle of the heart; which was to be pierc'd through, nearly about the middle of the length of the same side. There was a wound on the external surface of the heart, of narrow dimension

tion indeed, but not less long than the point of the little finger's extremity is broad; so that, when I open'd the ventricle, I was at first surpriz'd, that the termination of the wound did not appear on the internal surface; till imagining, what was really the case, that the foramen was cover'd over by the network of thick fleshy fibres, and fasciculi, which lay opposite to the wound; I took those fibres and fasciculi away with great accuracy, as has been said in the fifteenth of the *Epistolæ Anatomicæ* (z): and it was manifest to all, that the wound had reach'd into the cavity of the ventricle, after piercing through the whole thickness of the fleshy paries, and the internal membrane.

In the lungs, we not only found the anterior surface itself of a black colour, and variegated; but we also found a part of the food which had been taken into the stomach, and which the larynx had intercepted, while it was thrown up by vomiting, in consequence of the proper offices and functions of the parts which are about the fauces having been disturb'd, in that tumultuous agitation of the whole body, and during the deficiency of the vital power: so that, besides what was in the bronchia, no inconsiderable portion of these ingesta had stagnated in the trunk of the aspera arteria. And we made no doubt, but the man's death had been more sudden on this account: and certainly the face, even for some days after death, was turgid; by reason of the vessels being so distended with blood, as to have the appearance which they are found to have in a suffocated person.

27. Those wounds of the heart which reach to the left ventricle, occur more seldom than those that penetrate to the right ventricle. For the heart is so situated, that a much less part of the former than of the latter ventricle, lies open to wounds, most of which are inflicted in a direct opposition to the heart. And this I consider as the effect of that same providence, whereby the larger trunks of the sanguiferous vessels are, wherever it was possible, either seated very deeply, or drawn back to a seat less liable to injuries. Thus the crural arteries pass, in great part, through the thighs internally, and through the ham: thus the brachials are carried through that side of the humerus which is turn'd towards the thorax; and not on the external part.

And the left ventricle of the heart is certainly that, by the force of which blood is impell'd into the brain, and to all the body; so that if this force be very much weaken'd, and the office of the ventricle be very much impeded, death must of necessity be the consequence: and this Galen (a), with justice, pronounc'd would happen, "particularly if the belly of the left part of the heart should be wounded."

Now if you run over in your memory, the great number of wounds of the heart that you read in this third section of the *Sepulchretum* (b), you will be less surpriz'd, that those are by far the most in number which relate to the right ventricle; to which those two also relate, that I have pointed out

(z) n. 61.

(a) De Loc. aff. l. 5. 2.

(b) Obs. sub n. 23. & in Addit. Obs. 3.

above (c), from the History of the Royal Academy of Sciences at Paris: and out of the very few which have come within the left ventricle, you will see that there are none, after which the man dragg'd on his life, I do not say to the twenty-third day, or to the sixteenth, or to the ninth, or to the seventh, but to the fourth, or to the fifth; though you will see that life was carried on to those periods, more than once, after a wound penetrating the right ventricle.

You will find that both he of whom Diemerbroeck (d), and he of whom Timæus (e), gives the history, died immediately upon the perforation of the left ventricle. It is true, he liv'd an hour whom Lucius (f) speaks of; and even four or five hours another, whose case is related by Dolæus (g), though I believe no mention of it is made in the Sepulchretum; yet in both these patients both the ventricles were pierc'd through.

But what is an hour, or what are a few hours, to such a number of days as I have mention'd? to sixteen for instance, nay even to three-and-twenty; for to this period it is certain that Fantonus the father saw life extended in a case of this kind. And if by reason of some typographical error, you should doubt whether that observation of his, which we read in this section (b), relates to the right ventricle; you will have all your scruples remov'd, if you read the same over again, as it has been since publish'd, more than once, by his celebrated son (i).

There is, indeed, in the latter end of the Sepulchretum, another observation of the father's (k); on a man who "had liv'd seventeen days;" whereas "the septum of the heart was wounded in the basis, the wound slightly penetrating the left ventricle, and terminating in the right;" or, as the son afterwards publish'd it (l), "the wound slightly touching upon," or, "slightly injuring, the left ventricle of the heart, and penetrating into the right;" so as to make you naturally conjecture, that the septum being obliquely pierc'd through, "by a thin and very sharp sword," the left ventricle was slightly graz'd upon in the passage, but that the right was open'd; though "by a small foramen," just as in that other observation of which I first spoke.

But lest you should be in doubt about a history which is transferr'd into this section (m) from Henricus ab Heer, supposing that, because "he found the basis of the heart, and the apex thereof, pierc'd by two musquet-balls, with a very great laceration," the wound had reach'd into the left ventricle; read the whole of it, and you will find that the wound penetrated into neither of the ventricles: for otherwise he could not have satisfied these persons, who wonder'd how the life of the patient could have been produc'd to the end of the seventh day, by citing, as he says he then did, the opinion of the ancients, that, "when the substance of the heart only is injur'd, if the wound does not penetrate to the ventricles, the patient may

(c) n. 4.

(d) Obs. 23. cit. § 2.

(e) Ibid. § 18.

(f) Ibid. § 16.

(g) Eph. N. C. Dec. 2. A. 2. Obs. 188.

(b) Obs. cit. 23. § 12.

(i) Patern. Obs. 33.

(k) Obs. 17.

(l) Obs. 17.

(m) Obs. cit. 23. § 10.

“survive for some days, till he is snatch’d away by a supervening phlegmon.”

Nor does it escape me that, besides the various situation, the strait direction also, or obliquity, the shortness or length, but particularly the largeness or narrowness, of the wound, has a great effect in accelerating death, or retarding it; in proportion as the heart is more or less hurt, or more or less blood is discharg’d from one or other of the ventricles. For which reason I suppose that this man, whom I dissected, might have dragg’d on his life for some time longer, if suffocation had not been added to the wound (for regard must be had to the circumstances that are join’d with the wound of the heart in those who die very soon, as, for instance, in a certain observation of Mauchartus⁽ⁿ⁾) yet not so long as he that I have describ’d above^(o) from Valsalva, who liv’d quite to the eighteenth day, after a penetrating wound of the right ventricle.

And it seems that this difference may be gather’d from comparing, one with another, the great number of observations, which I have referr’d to, of one or the other ventricle being wounded; unless there be some one of those obstacles that I mention’d just now, or even others: as in this man whom I dissected, the reticulated fibres and fasciculi lying one upon another, and so covering the wound; as in him whom Bartholin^(p) examin’d, “the lips of the wound collapsing;” as in him of whom Billyus^(q) speaks, “a coagulum of concreted blood stopping up the wound of the heart:” or if there is no obstacle, even the very weakness of the heart in contracting itself, and consequently in throwing out the blood at the wound; which, in the histories of Fantonus that have been mention’d, the frequent swoonings, and the quantity of blood discharg’d, seem to show.

And for these reasons it was, perhaps, that the young man, whose right ventricle of the heart had been wounded with a knife; the wound being equal to six lines of Paris, and inflicted horizontally, at the distance of three inches from the apex, reaching from the external paries to the opposite side; did not die before the sixth day. There had been a great profusion of blood, a very considerable syncope (besides very slight swoonings), and that more than once; and on the three last days scarcely any pulse; though on the second and third there had been a violent fever, with a strong and full pulse: which circumstances, together with others that were remark’d with more accuracy than I remember to have read in most of the observations of the wounded heart, you may see describ’d, briefly indeed, but with great perspicuity, by Stephen Gaspareni^(r), formerly my auditor, but now an eminent physician and surgeon at Feltri.

When I had revis’d thus far what I have hitherto said, that excellent treatise of the heart, by the illustrious Archiater Senac, was brought to me: and in reading over that chapter^(s) which is entitled, “Of wounds of the heart,” I saw that it contain’d whatever could be wish’d for, as far as relates to the theory, to the useful comparison of observations one with another, and to

⁽ⁿ⁾ Eph. N. C. Cent. 1. Obs. 18.

^(o) n. 3.

^(p) Sect. hac Obs. cit. 23. § 15.

^(q) in Addit. ad hanc Sect. Obs. 3. in Schol.

^(r) Observ. Med. Chir. 9.

^(s) l. 4. ch. 6.

the cure itself, as far as any curative methods can be attempted. For which reason I make no scruple to persuade you to peruse the whole of it, more than once.

You will, at the same time, light on observations, some of which I was without, and chiefly those of his own that he gives; and among these, particularly, those which are of such a nature, as to confirm the opinion that wounds may penetrate into the ventricles, and yet no great effusion of blood be brought on; either because he found a deep wound stopp'd up with a coagulum of blood, or because the fibres, being irritated by the wound itself, contract themselves in such a manner, as to prevent the discharge of the blood; or in consequence of the wound being oblique: and he produces a singular instance of great obliquity; for he saw a wound, in which the sword had been pass'd through the substance of the heart, from the apex to the basis.

And although he admonishes that this kind of obstacle can happen less easily in wounds of the right ventricle, by reason of the thinness of the parietes; he, nevertheless, does not deny that the effusion of blood, from this ventricle also, is sometimes not very great. But if the hæmorrhage, from either of the ventricles, be not so large as, of itself, to be speedily fatal; yet he shows that from the inflammation which comes on afterwards, and unless this be discuss'd, from the considerable suppuration, there is great danger at hand. These things, however, I had rather you would see of yourself, than learn from my recital.

28. And from a wound also of a large sanguiferous vessel; one of those in particular that are contain'd in the thorax, especially an arterial tube; that a great quantity of blood is pour'd out, and the man carried off; if it were not both evident by reasonings, and confirm'd by the frequent dissections of wounded persons, an observation of Jo. Andreas Usenbezius (1), which you will add to the Sepulchretum, might show. And then, indeed, it is certainly in the power of the anatomists, to demonstrate from whence the blood was discharg'd.

Whereas, on the contrary, if a slender vessel be injur'd, the blood, flowing out slowly, may, by its quantity being continually, though gradually, increas'd, destroy the man; but it is sometimes with difficulty that it is found, from whence the blood has been discharg'd: and indeed this question, in some cases, cannot be determin'd at all, unless time be given for making the enquiry by the help of injection; as in a man, in whom one of the cavities of the thorax was seen to be fill'd with a great quantity of blood, from a wound. But from whence this blood had flow'd was so obscure, that it could not be found out, even by our Mediavia, a man whose accuracy was well known to me. As it is a history by no means despicable in other respects, I will immediately communicate it to you, in the same manner as he himself communicated it to me, on the very day of the dissection, which was the first of May 1742.

29. There was a French cook here, who, happening to quarrel with another man, was wounded, by his drawn sword, with a blow which pass'd ob-

liquely from the right side to the left. The wound indeed was manifest about the right side of the sternum, almost in the middle of it: but whether it penetrated into the cavity of the thorax, could not be distinguish'd by the probe, nor by any other means. The cough and the spitting, which was now and then ting'd with blood in several places, could signify nothing certain in a man who had been, for a long time, subject to a cough; and to cineritious and bloody expectorations, with a difficulty of breathing.

Yet this difficulty of breathing was now become much greater, and had a fever join'd to it, with a great frequency of pulse, a hardness, and a violence of stroke; but without any intermission, or inequality. And on the last day of his life also, which was the fourth from the infliction of the wound, although the pulse was become extremely bad; yet the patient lay supine, or on either side, just as he chose; and even sat up in bed to write a letter: nor ever complain'd of an anxiety of the heart, or of any pain whatever.

In examining into the state of the wound after death, the cartilage of one of those ribs that are join'd with the sternum, was found to be cut into, quite to the middle of its height; but the remaining passage of the sword could not be clearly found out. For this was the state of the thoracic cavities. The right cavity contain'd nothing but the lungs themselves, which were every where connected to the pleura, flaccid, of a blackish colour, and in a very bad state; but without any hardness. The left cavity, however, was very full of fluid blood; and in this blood the lungs floated, being every where unconnected and sound.

The internal surface of the sternum had a kind of blackness in the left side indeed, but not the least trace of incision; nor could any traces thereof be found in any vessel, nor in the lungs. The pericardium, which was become pretty thick on the right side, seem'd to have adher'd to the heart in some part of it; and contain'd a small quantity of yellow and mucous pus. The external surface of the heart was unequal, and in some measure corroded. In the ventricles was no blood: yet there were polypous concretions.

But the substance of the heart was so lax, and flaccid, that although about the basis of the right ventricle, where some very small part of that mucous pus adher'd externally, it seem'd to have a foramen, and very readily admitted a probe; yet it was doubtful whether there was a foramen before, or whether the probe had not made this foramen for itself, by reason of the great laxity of the muscular substance. Thus, as the disease of the thorax, which had been of long standing, had held the physicians in suspense while the man was living; so they also held the anatomists suspended in their opinion, after death.

30. That the sword had penetrated into the left cavity of the thorax, and wounded some sanguiferous vessel, appears from the quantity of blood which was extravasated thereinto, although it is uncertain what vessel this was. But as it is very difficult to understand, from the state of both these cavities, and of the heart and pericardium, how those symptoms could be present or absent, which it is very certain, from the history, were present or absent; we ought the more studiously to retain this observation in our memory, that those things sometimes happen which are less usual; not being ignorant that

we ascribe a great deal, for the most part, to the presence or absence of the symptoms; but not all the circumstances always.

31. Thus far of wounds of the thorax: in regard to which you will read a history of Jo. Adrian Slevogtius (*u*), that deserves notice, on account of the slight symptoms of their most considerable effects. And as I am now about to add some observations of blows, and compressions, which happen without a wound, we will begin with that which was formerly communicated to me by Ignatio Pedratti, a physician at Cremona, whom I have formerly spoken of to you (*x*). You may compare it with another which is propos'd by the same Slevogtius (*y*).

32. A man fell from his horse. The horse struck his breast with one of his feet, as he lay. No external mark of injury appear'd therefrom: but he had so great a difficulty of breathing, that neither by blood-lettings, nor by the application of proper remedies externally and internally, could the physicians prevent death from coming on within the fifteenth day after the blow. No rib was found to be broken in the dissection: but betwixt the ribs and the pleura was a tumour of a considerable size, made up of congested blood, as it were: and there was a disease in the lungs which corresponded thereto.

33. A country-lad, of ten years of age, lying upon the ground, had the wheels of a cart run over his thorax: though in what posture he lay could not be learn'd. This was known, that he expir'd within an hour: and this happen'd at Bologna, in the autumn of the year 1706.

As I examin'd the natural state of some of the parts, for the sake of anatomical improvement, I found blood extravasated in the thorax, and some ribs depress'd and broken on the left side; and, on the right side, I found the inferior lobe of the lungs torn away from the back; that is to say, open'd with a large and deep hiatus, in a longitudinal direction. In the heart was scarcely any blood, and no polypous concretion.

34. After what has been said, in the preceding letters, of great injuries being found within the head from the effect of blows, at the same time that the head has been externally sound; and these sometimes in the part opposite to the blows; I suppose you do not greatly expect that I should explain these two observations. To the second, however, you see that a cause was added, by a sudden compression streight'ning a viscus full of blood and air, and forcing it against the opposite ribs. But to the first you will see that those things relate, which will be said on a future occasion (*z*), of the internal parts of the belly being ruptur'd, while the abdomen was sound.

I rather chuse to take notice, at present, of some other histories which may be added to the *Sepulchretum*; and which relate to blows and compressions of the thorax, whereof we treat: To say nothing, therefore, of the suspicion of Gahrlipeius (*a*), of bones being generated betwixt the pleura and the coat of the lungs, at the juncture of the ribs; as if the first cause of

(*u*) Dissert. inscr. Vomica Pulmon. & cat. Exempla, § 61.

(*x*) Epist. 21. n. 43.

(*y*) Dissert. modo cit. § 21.

(*z*) Epist. 54. n. 14. & seqq.

(*a*) Eph. N. C. Dec. 3. A. 9, & 10. Obf.

them had been a preceding very violent dashing of the breast against the ground; read, in Bohn (*b*), of that old man being so violently dash'd against a bench, that, five ribs being broken "transversly," he died within a week in a state of suffocation.

The same author (*c*) also dissected another man, who died much sooner; because, besides that many more ribs were broken, and some laxated, blood, which had been extravasated within the thorax from the ruptur'd intercostal vessels, and from one of the internal mammary arteries, had accelerated the suffocation. And this man had been run over by the wheels of a loaded carriage.

That man was carried off by suffocation likewise, but unexpectedly, and on the eleventh day of the disease, who had been trampled upon by the horses as he lay prostrate on the ground, and whose back had been compress'd by the wheel of a loaded waggon passing over it. In this body, besides other things; Theodorus Zuingerus (*d*) saw three ribs broken, and the cartilages of some of them quite torn away. And Mery (*e*) found two ribs broken in an old man whose breast had been compress'd by the wheels of a passing chariot; the emphysematous tumour first beginning at the seat of the fracture, and, with a difficulty of respiration, afterwards increasing through almost the whole circumference of the body, till death came on in the fourth day; so as to make us not wonder that the husbandman (*f*), upon whose side the whole bulk of a plough had been dash'd in such a manner, by a horse who ran away with it, as to break a rib, upon which an emphysema came on, should, as often as ever he drew in the air, have "a tumour, of the bigness of a hen's egg, protuberating in the region of the broken rib;" which tumour receded soon after in expiration. But this patient, as he was a young man, of a robust constitution, and treated in a different manner from the old man, recover'd.

I had almost omitted a more surprising history, and one which relates pretty much to those things that have been said above of wounds of the heart. This history is Christian Vater's (*g*); who having found the upper ribs of a woman that had been violently struck upon the breast by a passing carriage, and kill'd thereby on that very day; having found the upper ribs, I say, near to the sternum, together with the clavicle, broken on the left side, although they were less bent inwards, and had injur'd the pericardium much less; within this cavity (the parietes of which were found, and distended with extravasated blood) nevertheless, found the right ventricle of the heart, not far from the apex, "ruptur'd to almost the length of an inch."

And this observation you will join with that which is transferr'd, from the royal surgeon Boirellus, into the Sepulchretum (*h*); I mean, of a man who died three or four hours after a leaden bullet, discharg'd from a musquet, had enter'd his breast: for although the bullet had stopp'd short on this side

(*b*) De Renunc. Vuln. Sect. 1.

(*c*) Ibid.

(*d*) Dec. modo cit. 3. A. 5, & 6. Obs. 277.

(*e*) Mem. de l'Acad. R. des Sc. A. 1713. Obs. 4.

(*f*) A&N. C. Tom 5. Obs. 51.

(*g*) Dec. 3. cit. A. 9, & 10. Obs. 104.

(*h*) In Addit. ad Sect. hanc 3. Obs. 1.

the pericardium, yet within this cavity, the parietes whereof were entirely unhurt, but distended with blood, was found a wound of the heart; and in the inferior part of the right ventricle, in like manner. In regard to which two histories, I suppose, you will not be much surpriz'd, that the wound or rupture of that ventricle brought on so sudden a death, if you observe that the blood could by no means get out from the pericardium, which was unhurt, as it did in other wounds of the heart; and that being, for this reason collected and crowded together, it had produc'd the same effect that, as has been already shown (*i*), a fluid effus'd into the cavity of the sound pericardium, from an internal cause, can produce.

But as to the heart being ruptur'd, without a rupture of the pericardium, Boirellus had promis'd that he would point out the cause of it when he publish'd his observation (*k*). And what Vaterus thought of this matter, you will see in the latter part of his observation. To me, however, though I do not disapprove the thoughts or inventions of others, it seems, that where the question is of the heart, or the arteries, being ruptur'd by a blow receiv'd on the body, without the parts themselves being touch'd by it; that ought to be added which Lancisi (*l*) did not doubt was to be attended to in the arteries, when weaken'd from a similar stroke: I mean, whether the percussio had happen'd in that point of time wherein they were dilated: for at that time, as they do not recede from the stroke, but even meet and give resistance to it, they themselves increase the cause of the injury.

And in proportion as the paries of the right ventricle of the heart, which is of itself thin, is thinner when dilated, it will be the more liable to receive an injury from the percussio. And if you add, that there is a greater quantity of blood in some bodies, you will the more clearly conceive of that paries being both dilated and extenuated, so as to be ruptur'd without great difficulty by the force of a sudden and very violent percussio.

Yet I do not think that animadversion of Lancisi is, of itself, sufficient to make us understand in what manner that could happen which Jacob Cicognini, formerly counsellor and physician at the court of Turin, and after that, as long as he liv'd, my most worthy colleague in this university, asserted to Valsalva and me that he had been witness to.

35. An old man, being busy in cutting wood in the forest of another person, was caught by the master of the forest in the middle of his theft. The master first blam'd him, which was answer'd from the old man by curses and threats; and, at length, as the old man was running away, the master struck him on the back, once only, with a club. The man fell down dead from the blow, after going two or three paces.

The great artery was found to be ruptur'd transversely, and cleft asunder; notwithstanding the vertebræ and ribs were found and unhurt.

36. What I said above (*m*) of the same artery, when, after a fall from a very high place, it was found by Valsalva in a perforated state within the pericardium, I must say here so much the more, where the artery is found to

(*i*) Epist. 26. n. 18.

(*k*) Zodiac. Med. Gall. A. 2. M. Jul. Obs. Schol.

20.

(*l*) De Aneur. l. 2. c. 2. Propos. 21. cum

(*m*) N. 8.

be ruptur'd transversely. The old man was struck with a stick; and how often, and how much, we have seen this artery to be eroded internally in old men, our letters to you sufficiently show. If it happen that this vessel was very near to rupture of itself, when it receiv'd a concussion from a violent blow upon the vertebræ, to which it adher'd; it will not seem very foreign to probability to suppose that it might be broken through: especially as by reason of the various passions and feelings of the old man, who was caught in the theft, enrag'd, and put to flight, the artery would be streighten'd at the same time, in several places, by irregular contractions; and the action of threatening and curling, and the efforts of running, would more speedily urge on the blood, and urge it more vehemently into this artery: to omit that, by two blows of this kind, (which, however, were receiv'd on the hypochondria) Samuel Grassius, as you will even read in the Sepulchretum (*n*), had, besides the spleen and the vena cava, seen the great artery also torn asunder in a young man.

And in the porter of whom I shall speak presently, the causes both of the sudden death, and of those parts that were found to be broken in the dead body, were, of themselves, very evident to all, and did not relate to the thorax only, but to the head also; as was the case in a man, and a young man, whom I have describ'd in the preceding letter (*o*): so that I scarcely deferr'd this observation to the present opportunity, on any other account, but to prevent my being too prolix in that letter; for it might with great propriety have been propos'd there.

37. A porter, of a pretty fat and muscular habit, being in very good health, and busy about something or other on a very high roof, fell down from thence, headlong, upon a road pav'd with hard stones, and died immediately. This happen'd in the month of January, in the year 1725, when the time was at hand in which anatomical demonstrations are annually given in this theatre.

His carcase was, therefore, given to the college, and was the more accurately dissected by me, as it was more fit for this purpose than most bodies are. But I shall now take notice of the preternatural appearances only, as I preserve the natural appearances, except a few, to another time; yet I shall not mention all that were preternatural, as I have hinted at some of these things when writing to you on other occasions, as will be said below in the proper places.

When the belly was open'd, we found some tract of the small intestines to be universally livid; and as two-and-twenty hours were not yet elaps'd since death, we distinguish'd the chyliferous vessels of that part of those intestines which was nearest to the stomach, that was distended with food; and for this reason we observ'd but a small quantity of bile in the gall-bladder. But in whom prominences were seated upon the ring of the pylorus, has been said in the twenty-ninth letter (*p*): as it has been hinted in the forty-third (*q*) what was the state of the urethra.

The trunk of the great artery, in all that part which belongs to the belly,

(*n*) In Addit. ad hanc Sect. Obs. 31.
(*o*) N. 34, & 35.

(*p*) N. 17.
(*q*) N. 9.

show'd here and there, internally, beginnings of future bone: and when look'd upon both internally and externally, instead of one cœliac artery, had three arising from itself; one of which was very small, two considerably large, but all very near to each other. The thorax had seventeen of its ribs broken. The left lobe of the lungs coher'd with the pleura. The superior vena cava, in the very extremity of it, appear'd to be in a manner eroded, as it were, on the internal surface; and the great artery, on its internal surface also, not far from the heart, was reticulated, for a considerable tract, with thick and white fibres: besides, at the curvature it had become indurated into a bony scale; and this disease was internal likewise.

Finally, the cranium, at the occiput, and the posterior parts of the sinciput, was broken asunder into fragments.

38. If I had chosen to attend to the principal cause of sudden death, this history ought to have been propos'd in the preceding letter; for you see from the comminution of the cranium into fragments, and those at the occiput, how great the concussion, not only of the cerebrum, must have been, but also of the cerebellum. Yet I chose to defer it to the present letter, not only for the reason I mention'd before, but also on account of the great number of ribs which were fractur'd.

From that letter you have examples wherein we saw the ribs also, though much fewer in number, and indeed some of the vertebræ dorsi, to be broken. Therefore, we not only pass by those things here, but that wound of the wool-comber likewise, which is already describ'd to you (r), and which was inflicted on the scapula, adding this one thing from anatomy; I mean, that we ought to take care, in wounds of that part, lest the upper limb of the same side be agitated: for the motion of this limb prevents those wounds from being easily brought to a cicatrix.

39. Before we treat, in the next letter, of wounds that relate to the belly, we must not omit here a wound which related to the belly and to the thorax at the same time; especially as it began in the thorax, which is the part we are now speaking of, and terminated in the same.

40. A taylor, of twenty years of age, was wounded by a foreigner, for a reason of very little consequence, by a double-edg'd and pretty broad knife, in the lower part of his right side. This happen'd on the 24th of March, in the year 1742; that is, on the very day when the resurrection of our Saviour was celebrated; a circumstance that made the fact more heinous.

He did not fall down after receiving the wound. But being immediately brought into the hospital, which was at some distance from thence, he vomited in the way, and discharg'd the excrements both of the intestines and bladder. When he came thither, he was cold all over his body; he had no strength, and no pulse; or, at least, his pulse was very obscure; and he scarcely could mutter over a few pious words. As the blood was discharg'd in very small quantity, the wound was for that reason dilated; but he show'd not the least sign of feeling. Therefore, after an hour, or a little more, from the infliction of the wound, he died without any difficulty of breathing, or any discharge of blood from the mouth.

Two days after the death of this patient, we began to dissect the body, accurately, in the same place, and continu'd the dissection the six following days; as it was very proper for our purpose by reason of the size and habit, which you could neither call fat nor lean. I shall take notice here only of what relates to the wound, and any thing else which occur'd unexpectedly.

The abdomen, which was neither tumid nor tense, and contain'd, nevertheless, such a quantity of blood as I shall mention, being cut into, and laid open, the surface of all the viscera appear'd to be slightly bloody. In observing the situation of these viscera, and among the others of the omentum, we found that, as it descended from the right side obliquely to the middle of the belly, it was drawn up on the left side, and roll'd together; so as to cover the stomach; and then we immediately went on to the examination of the wound.

The knife had enter'd the lower side of the right cavity of the thorax, betwixt the ninth and tenth rib; and after having pierc'd through the fleshy part of the diaphragm, near to those ribs, had pass'd through the nearest side of the liver, having enter'd it on the convex surface, at some distance from the lower edge, by a fissure about two inches in length; but having come out on the concave surface at a fissure somewhat less: so that the whole passage of the knife through the liver was not longer, in general, than two inches.

After it had come out from the liver, it was forc'd through the right kidney, at some distance from the upper part, passing obliquely, in like manner, from the anterior to the posterior surface, as in the liver; by a fissure which was almost one-half less in length than that in the liver. Finally, it had again pervaded the diaphragm, and had gone quite to the lower part of the cavity of the thorax, through the fleshy part of this muscle that lies behind the kidney: and, after having injur'd the trunk of the intercostal nerve, at the side of the twelfth vertebra dorsi; and a certain branch of the vena sine pari; and after having gone through such a number of other parts; it last of all wounded the neighbouring muscles which pass by the side of the spine: and these to the depth of an inch, or rather more, notwithstanding so many parts had been already pierc'd through at one stroke. Therefore, altho' neither in the intercostal muscles; nor in the diaphragm, nor in the liver, nor the kidney, nor in the side of the spine, nor in those muscles which I last of all mention'd, it had wounded any vessel of a considerable size; yet it had cut into so many smaller vessels, that within the short time for which life continu'd, no less a quantity of blood seem'd to have been effus'd, than if the emulgent vessels, or the vena portarum, or rather the trunk of the vena cava itself, all of which we found to be unhurt, had been wounded.

For, upon lifting up the intestines with the hands, a quantity of black blood was seen under them, and still more in the cavity of the pelvis; so that most of the persons who were present at the dissection, seem'd to think that there were twenty pounds at least: although, as it was so fluid that very few coagula could be observ'd therein, and as nothing of a polypous appearance was seen in the dissection of the whole body, either in the vessels, or in the heart itself, it is probable that it had also continu'd to flow from the incis'd vessels after death, and that it had increas'd the quantity of that which had been extravasated before death. This, at least, is certain, that,

at the end of the fourth day after the death of the man, we saw, even then, blood discharg'd from the very extremity of the wound which we have describ'd, at the side of the spine.

But whether part of the blood descended from thence, through the transfix'd diaphragm, into the belly; or whether, on the other hand, it ascended into the thorax of the supine carcase from the belly; is not easy to determine. This, however, is certain, that before the thorax was open'd; when, after removing the viscera of the belly, and exhausting the blood, we examin'd the diaphragm; blood issu'd forth from the last wound of this part; and, by pressing the hand upon that part of the diaphragm, something was perceiv'd to fluctuate above this place: and a kind of croaking and sound was heard, similar to that which arises from flatus included in the intestines. And, finally, when the thorax was open'd, some quantity of blood was found in the cavity on that side; and the lobe of the lungs therein was drawn upwards to a considerable degree.

For this lobe was every-where unconnected to the pleura; whereas the left lobe was connected thereto anteriorly, and at the side, but particularly on the back-part. Besides these things, there was nothing either in the thorax, or in the belly, that deserves to be taken notice of here. For it was to no purpose that we look'd whether there was any thing bloody contain'd in the bladder, by reason of the wounded kidney; as the small quantity of urine that was contain'd therein, was without any mixture of blood. But as to what we observ'd in the tunica-albuginea of one of the testes, this has been already said on a former occasion (*s*).

Of the appearances, however, that I saw in the dissection of the head, these things ought not to be pass'd over; I mean, that the right vertebral artery, at least within the cranium, was four times as wide as the left: and that within the dura mater, not only externally, but where it invests the lateral ventricles of the brain also, the vessels were not distended with a smaller quantity of blood, than if the man had died of a phrenzy. So, also, in those ventricles, each of which contain'd about a spoonful of clear water, the plexus choroides were of a blackish colour inclining to red.

So in whatever part the medullary substance was cut into, small bloody drops distill'd here and there; and if you wip'd these away, and compress'd the cerebrum, other larger drops immediately burst forth: and we thought it altogether surprizing, what should prevent the return of the blood from the cranium, unless we suppos'd some convulsive contractions to have been excited; in consequence of the injury done to the trunk of the intercostal nerve; which retain'd the blood there, in spite of the great extravasation thereof into the belly. And to these contractions you may also attribute the vomiting; although you, perhaps, have sufficient causes in the wounds of the kidney and diaphragm, from whence to account for the existence of this symptom.

41. But however these things might be; this you will, in particular, gather from the observation in question, (and from others similar thereto)

that if any surgeons happen to be not very well skill'd in anatomy, they may fall into very grievous mistakes, by supposing that wounds which enter betwixt the ribs, belong only to the thorax. That is to say, they are led aside by not being well acquainted with the arch'd situation of the diaphragm; and never observing that the upper part of the belly is, therefore, contain'd betwixt the ribs, they do not, in the least, suspect, that the viscera of this cavity may, at the same time, be injur'd by those wounds.

This danger is so much the more increas'd, if there be any cause in the belly, which drives the diaphragm up higher than usual: whether this be, as I have taken notice of in a fat woman (*t*), a quantity of pinguedinous matter, or of flatus, or of water, or even the bulk of the distended uterus, or of any other viscus; as, for instance, of the liver; whereby, even in a natural state, as I have already admonish'd (*u*), the right side of the diaphragm is frequently rais'd up. And the danger is still greater, if the wound is inflicted upon a person when in a recumbent posture, instead of standing upright.

Nor do wounds of this kind occur so rarely, but I can remember four instances at least; which you may add to the Sepulchretum; besides one of Glisson's (*x*), that certainly should have been inserted there, by those who compil'd and made additions to the Sepulchretum. The first is that of Mauchart (*y*), which is similar to the one produc'd above, from Valsalva (*z*), in this circumstance, that as much blood as was exhausted from the thorax, so much immediately flow'd in thither, by the wound of the diaphragm, from the belly.

The second is that of Goetzius (*a*). The third, of the celebrated Heister (*b*). And the fourth is that of Cramerus (*c*). And in all these cases, in fact, the wound descended from the thorax, which it had first enter'd, through the diaphragm into the belly, and had perforated the liver. Moreover, on account of the same confirmation, and position, of the diaphragm, which I have mention'd, and its declivity towards the posterior parts; it also happens, that if the wounds, inflicted upon the upper part of the abdomen, are continued to any considerable extent, not only the viscera of the belly, but those of the thorax also, will be wounded together with the diaphragm.

However, you see that wounds of this kind must be referr'd by us to the next letter; as we here attend to the part from whence they begin. You may therefore expect this letter shortly; and, in the mean while, farewell.

(*t*) Epist. 27. n. 2.

(*u*) Epist. Anat. 1. n. 13.

(*x*) Anat. Hep. c. 9. in fin.

(*y*) Eph. N. C. Cent. 1. Obs. 19.

(*z*) n. 3.

(*a*) Aët. N. C. Tom. 2. Obs. 181.

(*b*) Differt. de Medicinæ Utilit. in Jurisprud. n. 61. & seqq.

(*c*) Commerc. Litter. A. 1741. Hebd. 27. n. 1. ad cap. 2.

LETTER the FIFTY-FOURTH

Treats of Wounds and Blows of the Belly, Loins, and Arms.

1. **H**AVING treated of wounds of the chest and back, it comes next in order to treat of those that relate to the belly and the loins; and, that no others may remain, we will add those also that belong both to the superior and inferior limbs. First, then, take these observations from Val-salva.

2. A young man, of two-and-twenty years of age, was run at by a cow, and was wounded with her horn about one of his groins. He had a fever; and by degrees his face, and the remaining part of his body, began to swell: yet the tumour could not be class'd with those of the truly œdematous kind. Nothing occur'd besides this, that was worth notice, till the seven-teenth day. And then a difficulty of breathing came on, with a kind of pain, and impediment at the fauces; which, to the patient himself, seem'd to be like a bolus: and he affirm'd, that if he could get rid of this, he should be quite well in every other respect. Yet sometimes, tremors of the whole body were observ'd by those who sat by him; and the tumour thereof, in the mean while, continu'd and encreas'd. At length, about the twenty-second day from receiving the wound, death came on.

The wound being accurately examin'd in the dead body, began near the passage of the spermatic vessels through the muscles of the abdomen, and was continu'd betwixt the musculus rectus, and the tendons of the obliqui, where a quantity of coagulated blood was found. But it did not reach into the cavity of the belly. In this cavity the intestines were much distended with air, and there was a great quantity of stagnant serum.

In the thorax also was a stagnating serum. However, the viscera both of the thorax and belly were very sound. And indeed, the muscles, in several places, preserv'd their natural solidity.

If the tumour, wherewith the body of this young man was distended, had any circumstance attending it, which might make it referable to the class of emphysematous tumours; it might be conceiv'd, from hence, that an emphysema does not arise only from those wounds that penetrate into the cavity of the thorax, or aspera arteria. So even Bartholin, as you have it in this third section of the Sepulchretum (a), when an emphysema had oc-

(a) Obs. 20.

cupied not only the face but the whole body; could not, nevertheless, find a deep wound, and still less one that injur'd any internal part.

But as to that pain and impediment about the fauces, you remember that I have already made mention of it (*b*), not only from Valsalva, but also from the observations of Wepfer: to which you may add others of Eberhardus Gockelius (*c*), of Elias Camerarius (*d*), and of Maurice Reverhorst (*e*). If you examine all these observations, you will see that this impediment has particularly arisen from wounds: and, indeed, that it has often been the forerunner of convulsions of those parts, near to which this young man had been wounded; and these convulsions you see did come on, in this case also, under the appearance of tremors. And to the same cause was, perhaps, owing, not only the distention of the intestines, but also the effusion of serum into the belly and thorax, by giving a check to the motion of the blood and lymph, in their progress.

4. A man, of forty years of age, was wounded by leaden shot, from a pistol, at the margin of the right os ilium. At first no symptoms appear'd. But some days after a fever came on, with a very great rigor, and recurr'd every four-and-twenty hours: till about the fourteenth day, when he had been short of breath for the space of three days, the patient died; not without some suspicion of the intestines being wounded, for this reason, that a matter had been discharg'd from the wound almost similar to intestinal excrements.

Yet the wound had not penetrated into the cavity of the belly, and the viscera of this cavity were all uninjur'd. The wound itself abounded with leaden shot, which had broken the margin of the bone, that I have mention'd, into small pieces.

5. Although Valsalva has added to this observation, that he had seen another man, who died from a similar wound in the same part, without any other injury which deserv'd attention; and although you are not ignorant, what muscles have their tendons arising therefrom, or terminating therein; yet you will be prevented from supposing this consequence perpetual, by the observation of Meekrenius, which you even read in this section of the Sepulchretum (*f*). For "the spine, or appendix, of the os ilium, being broken into several parts, by a bullet," the man not only liv'd for "twelve weeks," as you have it in the Sepulchretum, "but for fourteen weeks;" and would not, to all appearance, have died even then, if the bullet had not injur'd other parts, and a sudden and violent passion of the mind had not, last of all, come on.

6. A young man, of three-and-twenty years of age, was wounded at the distance of four fingers breadths below the navel. A vomiting follow'd the wound. From the wound came out a portion of the omentum, which, within a few days, was so chang'd in its colour and appearance, as to resemble a firm and compact flesh. In a short time after the infliction of the wound, a diarrhæa came on. In the mean while, the abdomen preserv'd its natural state, if you except the upper part that corresponded to the stomach, which

(*b*) Epist. 15. n. 9.

(*c*) Eph. N. C. Dec. 3. A. 5. Obs. 37.

& 38.

(*d*) Ibid. Obs. 41.

(*e*) Epist. inter Problem. Ruysch. 14.

(*f*) in Additam. Obs. 4. cum Schol.

became slightly tumid. To these symptoms were at length join'd, a difficulty of breathing, and a very frequent cough; together with an expectoration of purulent matter, and a very troublesome pain in the right side of the thorax. And, after being tormented with these symptoms, the patient at length died.

The belly, being open'd, show'd no mark of injury at first sight. But by enquiring farther a purulent matter was soon after found, which stagnated on the right side, betwixt the membranes of the mesentery, and peritonæum, just as if it had been contain'd in a follicle. This matter extended itself from the lower part of the belly, under the liver, quite to the diaphragm.

The corresponding cavity of the thorax also, not only contain'd some of the same kind of pus, but was so fill'd therewith, that no sooner was the knife forc'd into that cavity, in order to cut out the sternum, but the pus rush'd forth with an impetus. In this pus lay the lungs, in a contracted state, and inclining to a black colour. But about the right appendix of the diaphragm, was a pretty thick sanies; so that, at this part, the pus seem'd to have pass'd from the belly into the thorax, as if through a strainer; as so great a quantity of it stagnated about this region, both above and below but no evident passage could be observ'd.

The same quantity of extravasated matter, join'd with a very filthy odour, not only prevented us from enquiring very diligently into this circumstance, but also from enquiring whence so great a quantity of pus had proceeded; whether from a laceration of some of the mesenteric glands, and chyloferous vessels, since no mark of injury could be found in the intestines, or elsewhere.

7. As he who had seen the young man when living, and dissected him after death, I mean Valsalva, supposes that the wound had reach'd to the mesentery, in consequence of the intestines, by their lubricity, eluding the point of the instrument; as must have happen'd, in those who have been run thro' with a sword, and cur'd in a short time, with great success, one of whom I have even seen in this hospital; nothing forbids us to conceive from whence the pus first began to be discharg'd.

But by what way it pass'd from the belly into the thorax, is uncertain. For even in a man who lies in a supine state, and not to say in one who has a great difficulty of breathing, and lies supine for this reason; as the thorax must be sometimes, at least, higher than the belly; it is difficult to conceive, that pus can be carried from the posterior part of the belly, into the thorax, in such a manner as to be collected there in so much more large a quantity, than in the belly.

Nor is it more easy to conceive of it, if you should conjecture that it might be receiv'd into the circulation, and afterwards carried into the thorax: for why should it be carried into the corresponding side of the thorax; and into that part which was nearest to the part that it occupied in the belly; rather than into the other side, or into both, or into any other part of the body? Some things therefore must be suppos'd at a venture. But by this very circumstance it appears plainly, that the case is, as I have said, uncertain.

But in regard to the very great quantity of pus, you may either account for it from the same cause as Valsalva, and from a great quantity of fat in the

the mesentery; or you may suppose that by pus itself, the more pus is form'd, in proportion as it is more acrid, as was shown by that very frequent cough, and in proportion as it affects, or irritates, for a very long time, the parts within which it is contain'd, as it seems in this case to have done.

8. A certain man receiv'd a wound a little after supper, a sharp instrument being forc'd through the epigastrium, a little, to the left side, opposite to that rib, which is the third, if you reckon from the inferior parts. He immediately vomited; but what he brought up was quite free from blood: he discharg'd a considerable quantity of blood from the wound. Both of these symptoms return'd on the same night. In the morning the wound was in very violent pain; so that he could not bear the least contorsion of body, without complaining. The day after, at the break of day, he got up out of bed, and what he had in vain attempted before, had an easy and natural stool. But when he went to bed again, he was seiz'd with a kind of sudden swooning, and ceas'd to live; it being now six-and-thirty hours after receiving the wound.

In cutting into the abdomen, the muscles about the wound were found to be every where embrew'd in blood, as it were, for a considerable space; and the cavity of the belly, although the abdomen, when handled, had not been in the least tense, was fill'd with extravasated blood. Under the wound lay the omentum, and the intestinum colon, where it is connected with the stomach. The omentum had a slight injury: the intestine had none at all. But the stomach was perforated with a wound in the middle: and this wound was equal in breadth to the breadth of a filbert. But, although it was enquir'd with great accuracy, whether any other part was hurt besides these, or whether any pretty large vessel was incis'd; nothing was found to be injur'd, besides the parts I have mention'd.

9. Why, although a great quantity of blood had flow'd down into the cavity of the belly; yet no blood appear'd, either by vomiting or stool, any more than if the stomach had not been perforated by the wound, you will learn from the scholium which is subjoin'd to an observation pretty similar to this, that is the twenty-seventh (*g*), in this section of the Sepulchretum; and you will, moreover, learn other causes from the case of Glisson (*h*), which is very improperly omitted in the same place. But to that large effusion of blood into the belly, the sudden death is chiefly to be ascrib'd; especially as it follow'd a swooning.

However, that those persons die within a short time, for the most part, who have no part of the stomach wounded beside the fundus; perhaps even without this effusion of blood; is not only to be argu'd from the nerves, wherewith the fundus is furnish'd, in a great number, and from more than one origin, but is also clearly confirm'd by observations; that which was just now taken notice of from the Sepulchretum, being even set aside, on account of the wound of the thorax, which was adjoin'd to it; as, for instance, by the next to it (*i*), and by others which, besides these, are given by Bohn (*k*), and might be added to the Sepulchretum.

(*g*) § 1.

(*h*) Anat. Hepat. c. 9. in fin.

(*i*) § 2.

(*k*) De Renunc. Vuln. S. 2. c. 4.

And although this author, as well as the son of Etmuller also (*l*), recounts the causes, from which wounds inflicted on the stomach are not mortal sometimes; yet neither of them is silent in respect to the contrary causes: that is to say, those from whence death, for the most part, or frequently a great difficulty of succeeding in the cure, is the consequence.

Turn to three examples, that you have, of the stomach being wounded, two of which are pointed out, from Cowper, in the *Acta Eruditorum Lipsiensia* (*m*), and the third you have in the *Commercium Litterarium Norimbergense* (*n*). But as to the great quantity of blood being effus'd beneath, and yet the abdomen not being tense, you will remember that this has been observ'd by me also, in the case of the taylor (*o*).

10. A young man, of twenty-five years of age, receiv'd two wounds with a sword; the one about four fingers breadth below the xiphoid cartilage, but on the left side, that is to say, about the fourth and fifth rib, reckoning from the lower part upwards; the other a little below the hypochondrium, and on the left side, in like manner. At both wounds the omentum came forth. The wounded young man first went home: but being scarcely able to stand, when he came there, by reason of faintness; he was carried from thence into the hospital of St. Mary de Morte. There, if he attempted to lie down, he felt that a suffocation was coming on, for which reason he was oblig'd to breathe with his neck erect. In the mean while he vomited. He took nothing. At the thirteenth hour after receiving the wounds he died.

The belly and thorax being open'd, in both of them was found extravasated blood, but not in great quantity. The inferior wound had also, in fact, penetrated into the very cavity of the belly; but had touch'd none of the viscera. The superior wound, however, had hurt the viscera, both of the thorax and belly. For the left lobe of the lungs was a little incis'd at its lower and extreme part: but previously to this the sword had pass'd through the diaphragm, leaving a broad wound: and the upper part of the stomach was wounded on both sides; whereby not only the cavity of this viscus was fill'd with blood, but a passage had even been open'd for the stomach itself, through the diaphragm, so that it had pass'd into the cavity of the thorax; together with a portion of the omentum.

11. Of wounds of the stomach we have written just now; and of wounds of the diaphragm we treated in the preceding letter (*p*). And although we have seen a wound of the diaphragm, join'd with wounds either of the heart (*q*), or of the liver and kidney (*r*), in that letter, we have not as yet, however, seen it join'd with a wound of the stomach, as in this case. Indeed, the beginning of those wounds was in the parietes of the thorax; but the beginning of this in the belly: and the position of the diaphragm, which was made mention of in that letter (*s*), was the reason that the wound, proceeding from this beginning, communicated its injury to a viscus of the thorax also; as beginning from the thorax likewise, it communicated its injury to the viscera of the belly.

(*l*) In Programm. cit. ad n. 32. Epist. 36.

(*m*) A. 1699. M. Febr. in Relat. ejus Anat. ad Tab. 35.

(*n*) A. 1736. Hebd. 16. n. 4.

(*o*) Epist. 53. n. 40.

(*p*) n. 4. & 6.

(*q*) n. 3.

(*r*) n. 41.

(*r*) n. 40.

But as the observation in question has this peculiarity in it, that the wounded stomach ascended through the wound of the diaphragm; it is proper that we speak a few words upon this case, which, though not very rare, is, however, not very frequent, as you well know.

The diaphragm consisting of a nervous, that is a tendinous part, and of a fleshy part, which surrounds the other; and being naturally perforated by more than one foramen; is so interpos'd to the thorax and belly, that it lifts itself up, like an arch, into the cavity of the former, and no where with more declivity than at the posterior part; and this most of all in man: for which reason Pechlinus (*t*) has admonish'd us, that in a wound which is inflicted upon the parietes of the thorax, at a considerable distance from the posterior part; the discharge of extravasated blood, or pus, is not only to be assisted by the inflection of the body to the wound, but by inspiration also; that is to say, that the more the diaphragm, which is then contracted, approaches to the figure of a plane, the less declivity there is to be overcome by the humours, which have flow'd down into that more declining and deeper posterior part of the thorax.

And although the wounds of this very septum are said, by Hippocrates (*u*), to be "mortal;" yet from the words which Hippocrates has made use of, Galen (*x*) has admonish'd us, that those are to be understood which are large and deep, not those that are small and superficially inflicted; not even if they "are in the nervous part of the septum:" for in this very part, he has not said that these slight, but that those large and deep wounds, "do not coalesce." And it is certain that you will see many examples produc'd, of wounds in the fleshy part being cur'd: to which you may, moreover, add three even from Boscus (*y*) alone.

But it is much more difficult to find equal examples of wounds in the nervous part. Yet, in the history remark'd by the father-in-law of Sennertus, the diaphragm being pierc'd through in the nervous part, you will, at least, read this, that after a curative application of two months, the patient "had seem'd to himself to be pretty well," for five months; if you examine Sennertus himself (*z*), instead of the Sepulchretum (*a*), wherein the same history is lamely copied in many particulars. However, wounds even of the fleshy part, not to say of the tendinous part, in the septum transversum, are, for the most part, mortal, and that within a little space of time.

Yet whenever the stomach is carried up through the diaphragm into the thorax, as it even happen'd in the case of Sennertus; it does not always happen through a passage open'd by a wounding instrument. For to omit mentioning the sheep in which Peyerus (*b*) found a transverse opening in the upper and fleshy part of the diaphragm, bigger than the palm of a man's hand; this muscle having been broken through by the very great distension of the stomachs, and one of them having been forc'd up out of the belly within the thorax; there certainly are places in the diaphragm, through which,

(*t*) Hist. Vuln. Thorac. art. 11.

(*u*) Sect. 6. Aph. 18.

(*x*) Comment. in cit. Aph.

(*y*) De Facult. Anat. Lect. 4.

(*z*) Medic. Pract. l. 2. P. 2. c. 15.

(*a*) l. 3. S. 8. Obs. 27. § 7.

(*b*) Eph. N. C. Dec. 2. A. 4. Obs. 100.

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upon the drawing asunder of the fleshy fibres, and upon the giving way of the membranes, the stomach, or some part of the intestinal tube, or any other viscus, may pass over from the belly into the thorax.

Thus (beside the passage of the œsophagus of which I shall speak afterwards) I see it is related by Platner (*c*); that some part of the colon, but a still larger part of the omentum, and pancreas, was carried up through that passage which transmits one of the intercostal nerves; and this happen'd after very violent pains of the intestines.

Thus also, anteriorly, betwixt the fibres that come from the xiphoid cartilage and the neighbouring fibres, there generally is an interval through which something similar may happen: and I even suspected this to have happen'd in a husbandman, in whom I heard that Leprotti saw, at Rome, part of the intestine colon carried up, through the middle and anterior part of the diaphragm, in so great a quantity as to equal a span, when extended.

But as I afterwards heard, from those who had dissected the body, that neither this intestine, nor the foramen, the diameter of which was two thumbs breadths, and through which this part went out and came in, shew'd any sign of foregoing violence or disorder, and that the man died in decrepit age, from a manifest injury within the skull; I chose rather to suppose that it had been thus from the original formation; in the same manner as Chauvet (*d*) suppos'd it to have been in the case of the military officer, in the left cavity of whose thorax, besides the stomach and one half of the spleen, was a part of the intestine likewise that has been mention'd; which, however, did not return by the same foramen that it enter'd, but by another: and the cartilaginous borders of these foramina adher'd closely to the viscera, which pass'd through by themselves.

You will also see, that Riverius (*e*), Bartholin (*f*), and Clauderus (*g*), had the same opinion in regard to two others, if you read the whole passage of Bartholin from the beginning to the end; for the beginning of it is omitted in the Sepulchretum. He and Clauderus speak of one and the same person: but the latter mentions many things of him when living; the former speaks of the body after death. The sum of the observation is, that the stomach, the omentum, a little part of the pancreas, and a pretty large part of the intestinum colon, had lain hid in the left cavity of the thorax: and this part of the colon, together with the duodenum, came out at the same foramen by which it enter'd; this foramen being large in its size, and circumscrib'd by a nervous circle, which was open'd in a peculiar manner in the subjected diaphragm, that was wholly fleshy.

The other young man, describ'd by Riverius, had only the stomach in the thorax, but this on the right side; which part of the thorax, as it was without any lungs, shew'd this to have been the state of the parts from the very birth. By what passage the intestine duodenum came out through the septum transversum, Riverius has been silent. These things, however, he has made known, that the young man, during the whole course of his life, had not

(*c*) Disp. de Hydrocel. not. ϕ ad § 2.

(*e*) Sepulchr. Obs. 27. cit. § 2. cum Schol.

(*d*) Hist. de l'Acad. R. des Sc. A. 1729.

(*f*) Ibid. § 3.

Obs. Anat. 2.

(*g*) Obs. 12. in Addit. ad eand. Sect.

been "very much" oppress'd with a difficulty of breathing; for so it ought to have been said in the Sepulchretum also; and that the most violent strainings to vomit, from the taking of antimony, were entirely without effect; the stomach being, as Riverius suppos'd, prevented from discharging itself by the ribs that were around it.

As to the young man of whom Clauderus and Bartholin speak, he had always enjoy'd a free and easy respiration; if you except a sudden and speedily evanescent asthma: and this young man died in the midst of almost infinite vomitings; although the stomach, being connected by some very strong bandages to the diaphragm, and that neighbourhood where it was join'd with the gula, reach'd, with the other part of it that was turn'd upwards, almost to the clavicles; occupying nearly the whole cavity of the thorax wherein it was included.

What symptoms an infant of two months old was troubl'd with, who was in an ill state of health from the very birth, and in whom, after death, Carolus Hultius found almost all the intestines, together with the mesentery, carried up into the thorax, through a foramen form'd by nature in the diaphragm, on the left side of the foramen of the gula, you will learn from the *Acta Eruditorum Lipsiensia* (b).

And I should also suppose that the fissure of the diaphragm, through which the celebrated Stehelinus (i) saw the stomach, the spleen, a part of the liver, of the intestine duodenum, and omentum, carried up into the left cavity of the thorax, in a foetus, was from nature herself; I should suppose so, I say, as the left lobe of the lungs consisted only of one lobule, and was three times less than the right lobe.

I purposely omit what viscera of the belly have been seen in the thorax of other foetuses, which were quite monsters in their formation; as in one of a sow, and in two human foetuses, by a certain anonymous author (k), by Lemery (l), by Vernoyus (m); and that all, in general, saw the diaphragm perforated. For the intention of my discourse requires, that I should return to those bodies in which not the first conformation, but the effects of disease, and particularly wounds, have forc'd the stomach, or any other viscus, into the thorax.

12. The observation of Littre (n) shows that there were, besides a difficult respiration, frequent but ineffectual strainings to vomit, in a dog whose stomach had gone out into the thorax by the same foramen through which the gula enters. And two circumstances show'd this not to have been so naturally; the first, the length of the gula itself, which has not been observ'd by others, I mean, in so great a degree; for when he soon after replac'd the stomach in its natural situation, the gula gave no resistance at all thereto: the second, a large fissure, into which that foramen of the diaphragm had been enlarg'd whereby the same gula is wont to pass, but the intestine duodenum then

(b) A. 1702. M. Decembr.

(i) Tentam Medic. th. 3.

(k) Zodiac. Medic. Gall. A. 4. M. Febr. Obs. 14.

(l) Mem. de l'Acad. R. des Sc. A. 1724.

(m) Comment. Acad. Sc. Imp. Petropol. Tom. 3.

(n) Hist. de l'Acad. R. des Sc. A. 1706. Obs. Anat. 10.

pass'd through; which fissure had already contracted a cicatrix a long time before.

Littre suppos'd the diaphragm to have been thus fissur'd, either from some very violent convulsion of the œsophagus, drawing the stomach upwards, or from a contraction of the diaphragm, and the muscles of the abdomen, at the same time; which contraction the stomach, at that time, perhaps, fill'd with solid aliments, as is often the case in a dog, had assisted.

And I thought it proper not only to take notice to you here of many things from the authors above-mention'd, but particularly of these things from Littre, that, by comparing them together, you may the more easily understand, whether different instruments of vomiting have been wont to be propos'd by different persons with propriety, or not; either when the stomach is in the thorax, and has been plac'd there in the original formation, or has been driven up thither by the force of disease: or, finally, to omit other things in this place which are to be touch'd upon hereafter, that you may conceive by what causes it is driven thither.

For as to its seeming to a very great man, in this our age, that the force wherewith the muscles of the abdomen urge the viscera of the belly upwards in expiration, may be estimated from hence, that they dilate a very small wound inflicted on the septum transversum, to such a degree, as to let the stomach pass up into the thorax this way; you doubtless perceive that, probably forgetting the explication of Littre, he ascrib'd to these muscles alone the whole of that effect, which he ought, unless I am deceiv'd, to have ascrib'd in part to those muscles, and in part to that septum being drawn downwards with great force; especially while, by means of a convulsion, or any endeavour in restraining respiration, it acts in concert with them.

However, if a wound happen to be inflicted in such a manner as to enlarge the foramen through which the œsophagus passes, it is evident that less power is sufficient to produce the same effect. And in this manner the wound had happen'd in a soldier, in whom Glandorp^(o) found that the left part of the stomach had ascended through the same œsophageal passage, together with a portion of the duodenum, and intestinum colon: and this soldier had been carried off by pain, and hæmorrhage, a very great syncope, with an interception of respiration, and a singultus.

And it may even happen, that there is sometimes need of less force; that is to say, in a man in whom this œsophageal passage is of itself pretty wide, as I have told you that it was seen by me in a certain shoemaker^(p). There is, on the other hand, when a force is requir'd either for a long time, and repeatedly, or in a very powerful degree; whether this same passage, or any other that is not sufficiently open'd by a wound, is to be overcome. It was repeated for eight days, in the case of that man in whom Henricus ab Heer^(q) saw that the small intestines had crept into the thorax by a "very narrow" wound of the diaphragm; as this patient did not feel the symptoms that shew'd such a state of the parts till the ninth day: and they became fatal within four-and-twenty hours.

(o) Sepulchr. S. hac 3. Obs. 21. § 9.
(p) Epist. 37. n. 30.

(q) Sep. Obs. cit. § 3.

And this force was, perhaps, repeated for five months together, in that student of whom we made mention above (*r*) from Sennertus; for, at the completion of these months, he at length began to be in an unhealthy state: and some days from thence, after frequently-repeated vomitings, and the most fatal symptoms, he died: so that, although there is some proof of not a small part of the stomach having enter'd the left cavity of the thorax several months before, when the wound was inflicted, and having forc'd the heart into the right side, where it was found; for the patient himself "desir'd them" to take notice of the pulsation being there, after the wound was receiv'd; yet there is some room to believe "that the whole of the stomach," the omentum, and the whole pancreas, had not ascended thither till the latter part of his life.

And there is still more room to believe this in that military officer, in whom, if you look into the Sepulchretum (*s*), you would suppose that Henricus ab Heer, who was spoken of just before, but if you read Parey (*t*), you would know that Guillemæus, had found a great part of the intestine colon driven up into the thorax, through a wound scarcely able to admit a little finger, which pass'd through the flesh of the diaphragm. For although a pain of the intestines us'd to attack him about the evening, yet it was not till the eighth month after receiving the wound, that it increas'd to so severe a degree as to make every remedy ineffectual, and to carry off the patient.

And if it is not the same case, which you will see transfer'd into the Sepulchretum (*u*), from Ballonius; as that pain is not said to have begun till a year after; there seems to have been occasion for a much more long-continued impulse, in order to carry that larger part of the colon through the diaphragm; after the lesser portion had "gradually" enter'd, as Ballonius himself thought. And certainly that celebrated man Fantonus, in the scholium to his father's twenty-third observation; of a young-man, who had been wounded a year before; does not think that the stomach, which had pass'd into the cavity of the thorax, by being thrust through the diaphragm; that was torn asunder where the œsophagus is transmitted through it; came thither before it had been contracted by pains, and vomitings, which took place from the time of inflicting the wound: and that being forc'd, thereby, against the diaphragm, it was, at length, able to tear it asunder; and, by this means, open a sufficient passage for itself.

And he wishes that which I also have wish'd for, every now and then, in many observations of this kind, not even altogether excepting that of Val-salva; I mean that some things had been farther remark'd, in regard to the conditions of the transmitted viscus, or the transmitting septum; and amongst these we place both the situation of the viscus, and of the wound, as in the history of Cloßæus (*x*); which shows, indeed, that the upper part of the intestine colon, which was nearest to the stomach, lay above the diaphragm, to the length of a span: but in what part this muscle was perfo-

(*r*) N. 11.

(*t*) Obs. cit. § 4.

(*u*) Oper. l. 9. c. 30.

(*u*) L. 3. S. 14. Obs. 8. § 8.

(*x*) Sepulchr. cit. Obs. 8. § 10.

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rated, and in which cavity of the thorax the intestine was receiv'd, we are not at all inform'd.

Yet as he asserts, that the man felt no injury "in the natural or vital faculties," for the whole space of two years after receiving his wound, till being seiz'd with a colic passion, he was carried off from among the living; it would have been natural to suppose, that the intestines, which were found to be "inflated, as if by means of bellows;" making an impetus upon the wound, had then, at length, laid open a passage for that portion of the colon; or, at least, for the greater part of it; if, by saying, that I know not what "had been found to be consolidated," he had not left us doubtful whether he speaks of the colon being somewhat wounded, or of the diaphragm.

But of the long-repeated force enough; now let us add examples of the force being very powerful.

13. It is certain, that in the first of all the observations, of the stomach being forc'd up within the thorax, which was made by Parey (*y*) upon a stone mason; the power, whereby it was impell'd, was very great. For through the wound of the tendinous part of the diaphragm, which was scarcely equal to a inch in breadth, was it found to be driven, three days after the wound had been inflicted. And Bartholin (*z*), found not only the stomach there, but also a part of the other viscera, and particularly of the spleen, in an observation which is, in most circumstances, similar to that we have given you from Valsalva.

For, in both of them, the stomach, and lungs, were wounded, together with the diaphragm, and death happen'd on the third day: so that, considering the time, the power appears to have been, without doubt, very great; although we are in neither of them inform'd, what part of the diaphragm was wounded; nor in that of Bartholin whether the wound was narrow or wide; nor, of consequence, how great a resistance there was, in the diaphragm, to be overcome by the impelling viscera.

But in the case of Schoberus (*a*) we are not wanting in these particulars, which case was so much the more violent, as, without any wound, a very vehement cardialgia came on, in the morning, at break of day; attended with very frequent vomitings, of an incredible quantity of blackish matter, and with strainings to vomit, so that the young man died on the following night: and within his thorax was found, together with the omentum, and intestine duodenum, with the jejunum, and a part of the ileum, the stomach so distended with that matter, and with flatus, as to compress, into a very narrow compass, the heart and the lungs; having been admitted into that cavity, by the same foramen through which the gula is brought down, this foramen "being greatly dilated and depriv'd of its tone."

And if you remember those things that I have hinted at above (*b*), with Littre, and Fantonus, you will not doubt but this may happen. For when the motion of the fibres of the œsophagus, the stomach, and intestines, is

(*y*) Sep. 1. 4. S. hac 3. Obs. 21. § 7.
(*z*) Ibid. Obs. 20. § 2.

(*a*) Eph. N. C. Cent. 3; & 4. Append. n^o
12. c. 1.
(*b*) n. 12.

inverted, by evident convulsions of the fibres; it is natural to conceive, that, the stomach; being carried upwards by the œsophagus, and at the same time (c) the matter being press'd downwards, out of the ascending stomach, by the fleshy fasciculi of the diaphragm, which are not yet very much weaken'd, and which intercept that foramen; is carried up in an empty state, and those intestines in the same manner: till the force of the inverted motion being continued, and encreas'd, the matter is driven still upwards, and upwards, from the lower parts, so as to overcome the resistance of these fasciculi, and distend the stomach.

And now you have almost all the examples, of the viscera being carried up through the septum transversum into the thorax, which were in my hands at this time of writing; so that you may compare them with the observation propos'd by Valsalva: I say, almost all. For as to that which I might have quoted from Valentinus (d), of the omentum having fallen through a foramen, formerly made in the diaphragm of a dog, into the thorax; it is not only a very inconsiderable case, but without any mention of the situation of that foramen, or of the symptoms.

That observation of Beckerus is of more importance, indeed, and mentions the symptoms; but is quite silent as to the seat of the foramen, as far as I can gather from the *Acta Eruditorum Lipsiensia* (e). This observation is from a child of four years of age, whose stomach, spleen, and liver, were in the left cavity of the thorax, for two years together, as I suppose; for it had pass'd the first two-years of its life in tolerably good health. Nor does the observation of Carolus Piso, *De Morbis a Sero*, "section the second, part the second, and chapter the seventh," of a very great tumour of one of the kidneys, relate to this subject, as some seem to believe. For if it is that, as I suppose, which is extant in that seventh chapter of Piso, which is quoted, and under number forty-six; he indeed describes the septum transversum as having been driven upwards by the tumour of the kidney; but not as having been perforated.

Yet this muscle was perforated, by the erosion of a large cancerous tumour of the pancreas, which had thrust part of itself into the left cavity of the thorax, in the observation of Hertodus, which is transferr'd into the *Se-pulchretum* in another place (f). But to lay aside my suspicion, which I have made known to you, in regard to that observation, on a former occasion (g); you have, therein, more than sufficient of different causes, whereby to explain whatever had preceded, and the sudden death itself.

At length, when I revis'd this letter, I happen'd to light on that dissertation, which is the sixty-ninth among those chirurgical ones collected by the very excellent Haller; and as I took notice that some of the examples, I have mention'd here, were wanting therein, so I observ'd, that there were some, which, either on account of my being without the books, or by reason of the language in which they are written, I could not have inspected. You will, therefore, read them in that dissertation, and particularly the case

(c) c. 2 § 18.

(d) Eph. N. C. Dec. 3. A. 2. Obs. 124.

(e) A. 1706. M. April.

(f) l. 3. S. 22. Obs. 42.

(g) Epist. 40. n. 27.

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of that girl of Straßburg (*b*), whose symptoms and wound are describ'd: for by this wound she was principally carried off in a few hours; it being in the tendinous part of the diaphragm, and a portion of the spleen and stomach having enter'd the thorax, and forc'd the heart to the right side.

Moreover, I knew that four other examples, to appearance, are read in Blancard (*i*). But if you compare them with those that are produc'd above by me, you will see plainly that they are, in fact, the same with as many of them; although they are chang'd by a transformation which we cannot very easily bear: as, for instance, that student spoken of by Sennertus, into a certain native of Revel (*k*); the son of D. Rat, in Riverius, into a soldier (*l*); the stone-mason, in Parey, into the servant of a certain smith (*m*); and the military officer, spoken of by the same author, into the servant of a certain captain (*n*).

And as these two last changes are plac'd by Blancard in the very beginning of his book, it is not to be wonder'd at, that they have impos'd upon many candid and sincere men, who judge of others by themselves; and, therefore, suppose them to be honest before they find them otherwise, and suspect no such fraud: and, amongst these, it is not surprizing that he should have impos'd upon Bohn (*o*); so that, together with the two observations just now referr'd to in Parey, he has quoted the first and second of Blancard, as if not made out of them.

But from wounds of the abdomen let us go on to other examples of compressions, or concussions, of this part, which we may copy from the papers of Valsalva.

14. A man, of five-and-thirty years of age, was kick'd on the abdomen by a horse; from whence being seiz'd with cruel pains and vomiting, he was receiv'd into the hospital of St. Mary de Vita. And there, his pains continuing, with a sense of great weight in the lower part of the belly, and with a difficulty of breathing, he died.

The carcase, being dissected by Valsalva and Peter Molinelli, although it shew'd no contusion in the muscles of the abdomen which corresponded to the place of the injury; yet, when the belly was open'd, exhibited a very large quantity of extravasated blood, which had already begun to be corrupted. The sanguiferous vessels which pass through the omentum were ruptur'd; and the intestine ileum, which lay beneath the omentum, was quite cut asunder, almost transversely.

In the thorax, the lungs were affected with a very great inflammation: and there was a considerable polypous concretion in the right ventricle of the heart.

15. That the parts which are confin'd in the abdomen should be ruptur'd, without the abdomen itself, which first meets the blow, being at all injur'd, is by no means new or unusual. Thus Tulpius (*p*) twice, thus Fontanus (*q*),

(*b*) § 4.

(*i*) Anat. Pract. Ration.

(*k*) Cent. 2. Obs. 9.

(*l*) Cent. 1. Obs. 70.

(*m*) Ibid. Obs. 2.

(*n*) Ibid. Obs. 1.

(*o*) De Renunc. Vuln. S. 2. c. 4.

(*p*) Sepulchr. S. hac 3. Obs. 29 § 9. vel potius 8.

(*q*) Ibid. § 11.

thus Grassius (*r*), thus Raygerus (*s*), saw the spleen ruptur'd; the three first from a blow of a stick, the last from a fall: to which histories, that are propos'd in the Sepulchretum, you may add others also; as that which is extant in the Commentaries of the Imperial Academy at Petersburg (*t*), and that you meet with in the celebrated Heister (*u*). For both of them shew the same viscus to have been ruptur'd, and the same very great effusion of blood from thence into the cavity of the belly; the former from the blow of a man's fist, the latter from the kick of a horse. And that the same thing had happen'd in two others, by a similar kick of a horse, you will learn from the *Commercium Litterarium* (*x*). And Bohn (*y*) had reported the same thing to have been found in as many others, but from the blow of a stick.

Nor are other examples of the same kind wanting from blows of any kind, and among these from a fall, which have been remark'd by Peter Albrechtus (*z*), Gotth. Budæus (*a*), Lucas Schrockius (*b*), Hieronymus Laubius (*c*), and Johannes Storchius (*d*). And if you desire others, besides these, you will read two in Hoffman (*e*); and where you may look for two more, the *Commercium Litterarium* will shew you (*f*); and where you may, moreover, find still others, you will learn from Platner (*g*): and you will perceive that it is not without reason the last-mention'd author has said, that by a violent compression of the abdomen, the included "viscera are ruptur'd and lacerated, in such a manner that, all the blood being effus'd, death is soon the consequence. And it is found by experience, that this happens more frequently in the spleen than in any other viscus."

Nor is this to be wonder'd at, if you attend to the soft structure thereof, and the thinness of the coat wherewith it is invested. But if it become softer by the force of disease, and, by a quantity of slowly-circulated blood, is extended below the fortification of the ribs, it is so much the more easily ruptur'd; and pours out in less time the greater quantity of blood: and consequently brings on a more speedy death. And it even appears that this viscus, being become tumid, and almost "pultaceous," in a certain count (*h*), was of itself ruptur'd, and became the cause of sudden death.

But in the kidneys, in proportion as the structure is more compact, so much more reason is there for being surpris'd, when we read, in the observation quoted from Laubius, that, by reason of an external compression by a fall from on high, not only "the spleen was contus'd quite to rupture," but also that "a foramen, capable of admitting two fingers," was found "on the back of the left kidney;" or in Mauchart (*i*), that "a very violent and

(*r*) Ibid. in Addit. Obs. 31.

(*s*) Ibid. Obs. 30.

(*t*) Tom. 1. in Obs. Anat.

(*u*) Instit. Chir. P. 1. l. 1. c. 15. not. ad n. 2.

(*x*) A. 1736. Hebd. 16. n. 4. & A. 1740. Hebd. 21. n. 1.

(*y*) De Renunc. Vuln. S. 2. c. 4.

(*z*) Eph. N. C. Dec. 3. A. 9. Obs. 6.

(*a*) Earund. Cent. 1. & 2. Obs. 108.

(*b*) In Schol. ad eand. Obs.

(*c*) Aët. N. C. Tom. 2. Obs. 21.

(*d*) Commerc. Litter. A. 1731. Specim. 36.

(*e*) Medic. Rat. Tom. 3. S. 1. c. 7. § 54.

(*f*) A. 1738. Hebd. 32. n. 1. ad Part. 4.

& 5.

(*g*) Instit. Chir. § 717. not. a.

(*h*) Aët. N. C. Tom. 5. Obs. 125.

(*i*) Dissert. de Mydriasi, § 32.

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“ forcible impulsion of a round, and not sharp, stick, against the abdomen, “ without any solution of continuity,” was the cause, “ nevertheless, of the “ middle of the kidney, which was situated opposite to the part that received the violence, being burst, and proving fatal.”

And now that I have happen'd to speak of the viscera which serve for the secretion of urine; read, I beg of you, the observation of Theodore Zuinger (*k*), which gives you, with a great degree of accuracy, the symptoms and the dissection of a young man; who, having chanc'd to run violently, in the night, with his hypogastrium against the prominent branch of a tree, had not, indeed, the least mark of external injury therefrom, but unhappily got a rupture of his bladder, which was at that time full of urine.

However, not entirely to omit what happens to the other viscera; Heister, whom I have spoken of above, has produc'd two observations (*l*), besides that I pointed out before: the one of the viscera of the belly, which were found to be greatly contus'd and lacerated by very violent blows of a stick, though the stick was but slender; the other, in which he found the middle part of the liver perfectly ruptur'd by the force that had been applied from without; though, externally, not the least mark of injury was seen.

Platner (*m*) will also give you an example of the liver being ruptur'd, and another you may take from the *Commercium Litterarium* (*n*); from whence (*o*) you will, moreover, have a third, of a man being violently struck by a horse in the region of the liver: so that the lower ribs were broken, and the gibbous part of that viscus was cleft, with a great number of fissures, not very deeply however, as I suppose; since the belly was not fill'd with blood, but with a great deal of bloody lymph: and the patient did not die before the fourth day: so that it recalls to my mind that history of Hippocrates (*p*); “ A boy, “ who receiv'd a kick from a mule on his belly and liver, died on the fourth “ day;” although this boy, as you see, was also struck on the stomach, and had very different symptoms: all of which being attended to by that grave interpreter Vallesius (*q*), he judg'd that the boy died from the very acute inflammation of those viscera, and not from the rupture, or the effusion of blood.

And, certainly, if there had been a great effusion of blood, both reason, and the observation of Lanzonus (*r*), show us that death must have come on very speedily. For he who was struck with a fist, violently, upon the liver, and had in his belly “ an extravasation of blood, and a rupture of the vessels “ in the liver, fell down upon the ground soon after receiving the blow, and “ expir'd in a miserable manner.”

To this subject, also, would relate the history of a boy of seven years of age (*s*), who had been tramp'd upon; as he lay upon the ground with his face upwards; in such a manner, by horses which drew a chariot, that blood was extravasated from the liver, which was ruptur'd and lacerated on the

(*k*) Eph. N. C. Cent. 7. Obs. 30.

(*l*) Not. cit.

(*m*) Not. cit.

(*n*) A. 1738. Hebd. 32. n. 1. ad Part. 5.

(*o*) A. 1734. Hebd. 35. n. 3.

(*p*) Epid. 1. 5. n. 17.

(*q*) Comment. in hanc hist. quæ ipsi 38.

(*r*) Act. N. C. Tom. 2. Obs. 6.

(*s*) Comm. Litter. A. 1740. Heb. 52. n. 3.

right side, into the whole cavity of the belly, though this was externally unhurt; if other causes of the death which immediately follow'd, had not been found, at the same time, both in the thorax and in the neck.

But to come nearer, finally, to the observation of Valsalva, which has describ'd the sanguiferous vessels of the omentum, and the intestine ileum, as being ruptur'd; the same vessels, in a woman who was struck by a soldier, and who died suddenly after the whole belly was fill'd with extravasated blood; the same vessels, I say, were shown to be ruptur'd, in this woman, by the small coagula and grumous concretions of blood which were included within the duplicature of the omentum; as you will read in the Petersburg Commentaries just now refer'd to (*t*); where it is indeed said, "that, in this very extraordinary case of injury, this perhaps should be taken into consideration, that, contrary to the custom of nature, the omentum had grown into one substance with the fundus uteri;" yet the observation of Valsalva shows this to have been by no means necessary.

But as to what relates to the intestine which was ruptur'd by the kick of a horse, you may compare with this observation that of Kramerus (*u*) on a carman who died from the same cause, but not at the same time, nor from the same internal injury alone; unless you should suspect that the rupture of the intestine ileum is rather to be attributed to a gangrene of the intestines; as that hiatus, which was observ'd in a young man who died not many days after his master had struck him violently upon his belly with a stick, ought, without doubt, agreeably to the opinion of Helwick (*x*), to be ascrib'd to the sphacelus wherewith the colon and ileum had been affected.

Yet even without these, you have in the Sepulchretum (*y*), not only the intestine jejunum ruptur'd, from very violent tramplings of the feet upon the loins and back of a man, when prostrate; but you have also the ileum and the colon perforated, in more than one place, from a very violent dashing of the abdomen against the trunk of a tree, in another (*z*); although the abdomen was found in both of them.

Do not, however, be surpriz'd that, although the abdomen of a woman, who has been describ'd to you in a former letter (*a*), was struck with a stick, and the most violent symptoms were the consequences of the blow, she nevertheless complain'd of a pain in this part only; and that nothing was found to be injur'd within the abdomen, and still less any thing ruptur'd. For all blows are not inflicted with the same degree of force; nor are the intestines equally liable to rupture in all persons: either from their natural propensity; as Aristotle has asserted (*b*), that stags "have their intestine so thin and weak, that although you strike the abdomen but slightly, it may be ruptur'd, without any rupture of the skin;" or from repletion.

And, certainly, in both of those whose histories I have just now pointed out from the Sepulchretum, the intestines were then extremely fill'd, and

(*t*) Tom. cit. ibid.

(*u*) Commerc. cit. A. 1740. Hebd. 26. n. 2.

(*x*) Eph. N. C. Dec. 3. A. 9. & 10. Obs. 120.

(*y*) In Addit. ad hanc S. Obs. 25.

(*z*) L. 3. S. 14. Obs. 47.

(*a*) Epist. 49. n. 6.

(*b*) Hist. Animal. l. 6. c. 29. in fin.

distended beyond their usual degree, by too great a quantity of fluid; as you will learn from the reading of the observations, and from the scholium, moreover, which is added to the first. You, therefore, if at any time you know that, besides the violence of the blows upon the abdomen, there was at that time a distension of the intestines, from any cause whatsoever; and very considerable and peculiar symptoms come on; will suspect what might happen inwardly, although you see no mark of injury in the skin: and if you are able to do nothing else, you will at least declare your suspicion to those whom it may concern, and that cautiously and with discretion.

And, indeed, if there has not been that distension, and those symptoms do not immediately come on; do not then be without all fear, lest some latent evil gradually increase, and the symptoms thereof break out universally and unexpectedly. Plancus has, with great propriety, said to M. Tullus (c): “I cannot help being in dread, if there be any thing of a wound under the skin, which may do much mischief before it can be known and cur’d.” Read the observation of Lospichlerus (d), and you will perceive that what I say is true. For you will see what kind of fatal disorder at length arose about the fundus of the stomach, in a man who, many years before, had fallen down with his horse; and who, though he felt a violent “compression of the saddle upon his stomach,” had, nevertheless, totally neglected it.

And Platner (e) has, with great propriety, admonish’d us, that scirrhi frequently arise from blows on the other viscera also; disorders which, as you very well know, begin slowly and increase gradually: although it sometimes happens, from the very beginning, that marks of the injury receiv’d discover themselves, and do not fail to continue quite to the end, although in a mild degree; as happen’d to the young man, whom the illustrious Haller (f) describ’d, that was “kick’d upon the abdomen” by his drunken companions.

16. A boy, of nine years of age, having fallen under a carriage, had the wheel run over his belly, and died in this manner. The pain of his belly, indeed, was not great; yet the pulse was but just perceiv’d: the extremities were very cold: the patient scarcely ever lay still, but turn’d himself alternately from one side to the other, with great anxiety. Finally, an hour or two after the pressure of the wheel had been suffer’d, convulsive motions came on; and he died within a quarter of an hour.

The abdomen, which was very tense, being cut into, a quantity of fluid blood was found to be extravasated into the belly; and the intestines were seen to be turgid with air. The right part of the liver, where it is turn’d towards the ribs, was deeply lacerated, to the extent of three inches of Bologna.

In the thorax, the lungs were found to be every-where unconnected on all sides, and sound; except that, on the back-part, they were slightly inflam’d. The ventricles of the heart contain’d a fluid and frothy blood.

(c) Inter Epist. ad Familiar. l. 6. Epist. 18.

(d) Eph. N. C. Cent. 1, & 2. Obs. 151.

(e) Instit. cit. § 718.

(f) Opusc. Pathol. Obs. 25.

17. In turning over the Sepulchretum, you will find two observations, one of which relates to the wheels of an empty waggon (*g*), and the other to those of a well-loaded chariot (*h*), having pass'd over the belly. And, indeed, the different weight of the compressing body ought to be attended to; and, at the same time, the various resistance of the man that is press'd upon; whether you consider his age, or the part of his belly which is compress'd: and the first of those who are there describ'd, was about thirty years of age; the other somewhat more.

The hypogastrium of the first had been compress'd a little above the pubes; and the hypochondrium of the other. In the former, who died within six-and-thirty hours; and not without convulsive motions; under the skin of the abdomen, and the other integuments thereof, which were found, the intestine ileum was found to be perforated: a circumstance that had happen'd the more easily, because it was distended in consequence of drunkenness. In the other, however, who dragg'd on his life for a considerable time, they found the liver to be in an entire state, under the spurious ribs, which were also entire; and none of those parts that are in the cavity of the belly, was ruptur'd: but only a large abscess was found betwixt the muscles of the abdomen and the peritonæum.

But he was a boy of nine years of age, in whom Valsalva found the liver lacerated; and those three were boys also, in speaking of whom above (*i*), from the celebrated Heister, I have said that some viscus, and in the third the liver itself, was entirely ruptur'd in the middle, from the violence applied to the abdomen externally; although the skin itself was found.

And it was still a boy, who, falling down drunk from the shafts of a waggon, was violently press'd upon by the axle-tree and hind-wheel of the carriage; so that he died ten hours after: and had, besides, contusions of the intestines, here and there, with livid appearances; the pylorus, the liver, the vena portarum, and the right kidney, entirely ruptur'd, through the middle, to the great surprize of Preussius (*k*); who wonder'd how it could have happen'd, that he should live so many hours after having undergone such a number of injuries, and having had so large an extravasation of blood, with which he found the belly to be full: and he also wonder'd that the skin was no-where ruptur'd, not even in the abdomen; unless we should, perhaps, say that it was in consequence of this being soft, and easily extended, by reason of the soft viscera being subjected to it, which would suffer the skin to yield, and remain unhurt; and that those viscera were necessarily fissur'd, because they could not give way, but were forc'd and driven against the posterior parietes of the belly, where it is in great measure bony; and these parietes with great violence against the very hard ground, that lay under them.

And, indeed, the same thing seems to happen to the natural integuments of the body, sometimes, that happens to the clothes we wear, which are frequently unhurt by a blow, when the body is wounded beneath. Thus I

(*g*) Additam. ad hanc S. Obs. 27. cum

(*i*) N. 15.

Schol.

(*k*) Eph. N. C. Dec. 3. A. 5. & 6. Obs.

(*h*) L. 3. S. 17. Obs. 29.

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have heard, from a colleague of undoubted credit, that the abdomen of a pregnant woman, which had been gor'd by the horn of an ox, was ruptur'd in such a manner, notwithstanding her clothes were neither perforated nor torn, that the uterus could be seen; and that a hernia remain'd there after the cure, which was accurately attended to by himself. And I myself saw a wound, in another colleague of mine, who, while he liv'd, was the very worthy abbe of this celebrated monastery of St. Justin, upon the posterior part of the left sincipital bone, which had been lately brought to a cicatrix, and which had been inflicted fifteen days before, accidentally, by the fall of an angular stone, of two pounds weight, that had neither cut his cap, nor his cowl, nor his under thin linen-cap, wherewith his head was cover'd, nor made any perforation in them; but had wounded the natural integuments of his head, that lay beneath, in such a manner, that a great quantity of blood was immediately discharg'd.

And these things are said of blows or compressions of the belly. But whether to one or the other of these causes, or to both of them, or even to a very violent concussion, is to be attributed what you will see related in the next history, you yourself will judge. It was not only related to me by Valsalva, but left in his papers also.

18. A builder, about six-and-thirty years of age, falling from a high building into the dirt, remain'd in a state of stupor. No external injury appear'd. The abdomen swell'd a little after, and became tense. The pulse was so small as scarcely to be perceivable. He died within twelve hours.

On opening the belly, the cause of this part becoming tumid was found to be extravasated blood. In some of the membranes of that cavity, a blackness from contusion appear'd. Yet from the rupture of what vessel the blood had been discharg'd, it was difficult to find out. It might, however, be suppos'd to have proceeded from a branch of the vena cava, because this vein was entirely depleted.

19. And, indeed, in another man, who had fallen from on high, Jacobus Sylvius saw, formerly, a great quantity of blood pour'd out from the ruptur'd vena cava into the cavity of the belly; as you also have it in the Sepulchretum (*l*). And what was found by Valsalva in the belly of a virgin, who had fallen from a considerable height, I have already told you (*m*). Now let us see what descriptions he has left relative to blows upon the loins, and that neighbourhood.

20. A man, very near forty years of age, was wounded with two musquet-balls, in this manner: The balls enter'd at the right side of the second and third vertebræ lumborum, opening only one foramen for themselves; and they went out at a double foramen, the one being pretty large, the other but small, from the middle of the abdomen, about two fingers breadths above the navel. The wounded man went to a place which was not far distant, where remedies were applied by a surgeon. He, from that time, complain'd of violent pain: he was oblig'd to breathe with his neck erect, and not without considerable difficulty and shortness: he more than once vomited: his

(*l*) Sect. hac 3. Obs. 28. § 6.

(*m*) Epist. 40. n. 9.

urine he endeavour'd to discharge, but in vain : his pulse became gradually small and weak : at length, continuing to speak, and having his senses in a very perfect state, and having taken in the air sometimes with a gaping mouth, which is the certain forerunner of death, he died on the ninth hour after receiving the wound.

The whole back of the carcase began to be livid some hours after death. The day following, in the morning, not only the lividness had increas'd, but, moreover, the whole head was become disfigur'd, and the right eye had swollen to a very great degree. The lips of the wound inclin'd to putrefaction on both sides.

In the belly an extravasated blood was stagnant. The intestinum ileum was perfectly lacerated in three places ; and the colon, in that part which is connected to the stomach, was wounded in one half of its breadth : and all the intestines were red.

As the wound enter'd the cavity of the belly a little below the right emulgent vein, near to the seat of the ureter, it was doubted whether this part was not lacerated. But as the intolerable stench of the carcase oblig'd us to hasten to a conclusion, the matter could not be sufficiently examin'd. It was also doubted, whether the musquet-balls had not been infected with poison.

21. You might here, among other things, enquire how it could happen, that, as there were only two balls, they had lacerated the intestine ileum in three places ? if you did not take notice, that the convolutions of this intestine are of such a nature, that, one part of it being plac'd before the other, the intestine was twice met with in the passage which one of the balls had taken.

22. A man, of forty years of age, was wounded, by the discharge of unequal fragments of lead from a musquet, in such a manner, and in such a situation of body, that in the left buttock, where these fragments had enter'd, were three foramina ; and in the lumbar region, where they had pass'd out, near the lower rib, were seen two foramina. About the fifth day came on a suppression of urine ; and the patient complain'd, more than once, of a spasmodic pain at the upper margin of the os ileum, to such a degree that the whole body was suddenly shaken : and the part could scarcely suffer the touch of the surgeon's hand externally, by reason of the violence of the pain. The pain was increas'd every day ; and the convulsion, in consequence, became more violent and continual ; especially about the throat and the mouth. Yet he retain'd his senses, nevertheless. At length, he died on the thirteenth day.

The wound being examin'd by dissection, it was very evident that no leaden fragment had penetrated to the internal parts. Yet one of them had pass'd a different way from the others, and had broken into pieces the upper margin of the os ilium, where the tendons of the muscles are connected. However, there was no mark of injury in the belly, if you except a kind of blackness of the intestines, and still more of the omentum, as if from contusion.

But the cerebrum was perfectly sound ; so as not to shew the least traces of any serum.

23. This, I suppose, was that other man whom I have observ'd above (n) to have been seen by Valsalva, and to have died from a comminution of the margin of the os ilium, when I had describ'd one that was carried off by a wound of the same kind; but by little pieces of lead, which were not discharg'd on the posterior part in this manner. And near to that, which I just now copied, comes the observation of Harderus, with which I could wish to have a dissection join'd.

It is extant in the Sepulchretum (o), and speaks of a man being wounded with a musquet-ball "behind the nates;" the ball proceeding towards the superior parts, betwixt the muscles and tendons which belong to the back: and you will see, that, from this wound, at length, a strangury first arose, and soon after a convulsion about the throat and mouth; which, being at length propagated to the limbs, and afterwards to the whole body, soon carried off the patient.

24. After wounds follow blows receiv'd upon the loins, and the spine that lies betwixt them. In regard to which blows take the two following observations of Valsalva.

25. A man, of fifty years of age, happening to be walking in a very stooping posture, was struck, by a piece of wood that fell from a considerable height, in a very violent manner, on the three inferior vertebræ of the loins. He fell down half-dead; and, being brought into the hospital of St. Mary de Vita, died four hours after receiving the blow.

The loins, and, in particular, the common origins of the muscles call'd *longissimi dorsi*, and *sacro-lumbi*, were found to be stuff'd up with coagulated blood, from the contusion. Within the vertebræ, where the blow had been applied, was a small quantity of grumous blood; yet the included marrow was not at all injur'd, to appearance. The viscera were likewise unhurt. In the arteries alone; which in dead bodies are, for the most part, wont to contain little blood, so great a quantity of this fluid was found, and in a coagulated state, that they were entirely fill'd therewith; especially about the præcordia, where it had coagulated in a much greater degree.

26. Another man, of six-and-forty years of age, was struck on the back by a piece of falling wood. From thence the power of moving was entirely lost in the legs; though the power of feeling remain'd. The intestinal excrements were discharg'd involuntarily; the urine, by the help of the catheter alone; and this fluid, about the end of the disease, lost its natural colour, and resembl'd water in which fresh meat had been wash'd. In the part of the loins which had been struck, was scarcely any pain perceiv'd. But in this manner he gradually sunk, and was carried off on the fourteenth day.

The limbs of the carcase were lax externally, and easily moveable. The belly being open'd, the intestines were found to be ting'd, in many places, with a considerable blackness; where they were turn'd towards the parts that had been hurt. For the same blackness likewise was extended through the whole iliac and lumbar region; so that the blood appear'd, in some measure,

to be coagulated in the interstices of those parts. The spleen was also livid, to a very extraordinary degree, in one half of it. Finally, the lumbar vertebra, as the symptoms of the disease had previously shown, was found to be broken; some bony fragment being conspicuous from thence.

In the thorax, the lungs were distinguish'd with certain black spots; yet on the back part: and both lobes, but especially the left, and in the inferior part, were somewhat inflam'd. Both ventricles of the heart contain'd a polypous concretion; but the right the largest: for this enter'd into the pulmonary artery. However the blood was fluid in almost every part.

27. If you compare these two histories one with another, you will, without doubt, be surpriz'd that he, whose vertebræ are not said to have been broken, should have died within four hours; and that the other, who is said to have one of his vertebræ, at least, broken, should not die till the fourteenth day. Was it because this vertebra was not only one, but perhaps the lowest of all; and because the others were three in number? But those three also were the lower vertebræ: and you know that the body of the medulla spinalis itself does not reach down to the third vertebra lumborum: and it does not seem that so great a difference can be accounted for, from somewhat more, in number, of the nerves which compose the cauda equina, as it is call'd, receiving a concussion; as none of these, certainly, go to the parts above.

And I shall say the same, if you should choose to ascribe that difference to this circumstance; that within those three vertebræ there was some extravasated blood, no mention of which is made within this one. I confess, indeed, that the different consequences which attend an injury of the vertebræ, or of the spinal marrow itself, at different times, do not, frequently, seem to be capable of being easily explain'd.

I omit those observations, that you have in the Sepulchretum, of Rumerus (*p*), and Fontanus (*q*), on a fall from a high place. For, although the former describes similar symptoms with, and even more considerable than, the second observation of Valialva, and death on the seventh day; yet it does not appear what, and how many, vertebræ were injur'd; and to how great a degree they were injur'd: and the observation of Fontanus, as it tells us of five vertebræ dorſi being luxated, and does not only not take notice of symptoms of this kind, but shows that the life of the patient was prolong'd to a very considerable time; is liable to the doubts of those who do not acknowledge luxations of the vertebræ, as I shall show hereafter (*r*). Read over again, therefore, the history of Meekrenius in the same place (*s*); in which the musquet-bullet, passing betwixt two vertebræ of the loins, broke these vertebræ, and compress'd the spinal marrow; yet did not bring on those symptoms that I have mention'd, nor death till after twelve weeks: nay, as you have it in the author's own words, not even till after the fourteenth week.

And lest you should say, with Hornius (*t*), that the bullet had stopp'd at the

(*p*) Sect. hæc 3. Obs. 29. § 7.

(*q*) Ibid. Obs. 28. § 1.

(*r*) Epist. 36. n. 35.

(*s*) in Additam. Obs. 4. cum Schol.

(*t*) in Schol. modo cit.

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external integument of the spinal marrow, so that it could not compress it; add to this the observation of Bohn (*u*), who not only saw the spine, in the loins, perforated with a bullet in a military officer, but also “ the left half “ of the funis medullaris perforated at the same time; yet in such a manner, that not even the right half remain’d quite untouch’d:” violent symptoms being the consequence thereof, and life, nevertheless, being carried on to the eighth or ninth day.

But lest you should say, after all this, that the bullet which enter’d betwixt the second and third lumbar vertebræ (and much less that which enter’d between the third and fourth, as in the history of Meekrenius) could not have wounded the body of the medulla itself, but only the cauda equina; set both these histories aside; and rather read the observation of Platerus, which is extant in another part of the Sepulchretum (*x*).

In this observation we have the case of a virgin, in whom a leaden bullet, discharg’d from a musquet, having ruptur’d the spinal marrow, within the eighth or ninth vertebra dorsi, had immediately taken away, from the middle of the body downwards, the power of moving and feeling; and life was, nevertheless, prolong’d to the twentieth day. Nay, consider duly what Cuvilliers relates, in the History of the Royal Academy of Sciences (*y*), of a soldier, in whom the point of a sword, to the length of two inches, had pass’d through the twelfth vertebra of the back, and the included body of the marrow; and not only pass’d through, but adher’d there always, and excited the most severe pains indeed, but brought on no paralysis, as long as the patient liv’d: and he liv’d some months.

Now compare with these observations, that which you have in the Sepulchretum (*z*), of Marcellus Lucius. You will read of a man’s dying within about thirty hours, in whom a musquet-ball, having enter’d on the right side, four inches below the region of the kidneys, pass’d through the middle of the spinal marrow, and came out at the left side. Certainly this bullet had not pass’d through the body of the marrow, but the cauda equina.

How could it happen, then, that death was so much the sooner brought on, than in those, in whom the body of the marrow itself had been pass’d through; and yet, at the same time, so much later than in that first man of Valsalva’s, in whom this very cauda equina had not only not been pass’d through, but seem’d to be quite free from injury? Without doubt it is difficult, as I have said, to explain these differences.

Yet if there be any room for conjectures, which, perhaps, are not entirely to be disapprov’d; there may seem to have been two causes, why this man of Valsalva’s was snatch’d away by so sudden a death. For as he walk’d in a prone posture, when the piece of wood, falling down from on high, struck those three vertebræ; I should suppose that they receiv’d the more violent concussion, in consequence of the stroke being receiv’d less obliquely; the sanguiferous vessels being, by that means, ruptur’d, and discharging more blood than perhaps appear’d in that part, as in a falling and supine man, it might have flow’d into other vertebræ, about the body of the medulla:

(*u*) De Renunc. Vuln. S. 1. prope fin.

(*x*) l. 1. S. 15. Obs. 26.

(*y*) ad A. 1743. in Obs. Anat. 11.

(*z*) Sect. hac 3. Obs. 26. § 2.

nearly in the same manner as is suppos'd to have happen'd, by du Verney (*a*), in certain kinds of apoplexies, as it were, after he had, in one of them, seen blood flow down, not from the cranium, but from the tube of the vertebræ.

For that part being compress'd, "from whence the great number of nerves, which give origin to the branches of the intercostal nerve, arise," he thought "that the motion of the internal parts ceas'd." And I should suppose that it ceas'd so much the more easily, in our case, in proportion as the blood (which is another cause of my conjecture) resisted, by its thickness, the influence of the organs which propell'd it; or by that less than proper fluidity, from which it was found to be so concreted in the arteries, and still more about the præcordia.

28. To the blows of the limbs, at length, belongs the following observation of Valsalva: which not only shows how much regard ought to be paid to injuries of the extremities, but, at the same time, confirms this opinion, that, from a convulsion of the jaws, in cases of wounds, fatal convulsions of the whole body are shown to be at hand.

29. A man, of five-and-thirty years of age, was struck, with a very large stone, upon the extremity of his left foot. The contus'd part had no pain in it, unless in consequence of being touch'd. But from the middle, in particular, of the great toe, where the violent pain was excited by touching, it emitted no purulent matter, nor did by any means separate the lacerated fibres of the tendons. The man was in every respect well, and confess'd it, and went about his usual employments with alacrity. On the sixth day, however, he was suddenly seiz'd with tension and pains, and with a dreadful convulsion about the fauces. After this follow'd a very great convulsive motion in the whole body: and that was follow'd by death on the eighth day.

In dissecting the head, nothing preternatural was found, if you except a little serous matter stagnating in the ventricles of the brain.

30. Now let us subjoin some observations of our own, of wounds, or of blows, in the same parts that are hitherto spoken of; preserving the same order as before.

31. A man being afflicted with vomitings, and having a low and weak pulse, in consequence of a wound being inflict'd upon the hypogastrium, at the right side of the linea alba, together with some convulsive motions, but no swooning; he died within the third day, in this hospital, before the latter end of November, in the year 1742.

The abdomen, which was not tumid, being laid open, we found a quantity of extravasated blood in a coagulated state: and the intestine ileum was pierc'd through, where it corresponded to the wound.

32. Although the prudent and cautious physician, in forming a judgment of the fatality of wounds inflict'd even upon the small intestines, ought not to neglect those things which Abraham Vater (*b*) has learnedly and prudently written upon this subject; yet we, for the most part, experienc'd that to be too true, which, after Hippocrates (*c*), has been said by Celsus (*d*), "that

(*a*) *spud du Hamel Hist. R. Sc. Acad. l. 3.*

(*c*) *S. 6. Aph. 18.*

S. 5. c. 2. n. 1.

(*d*) *De Medic. l. 5. c. 26. S. 2.*

(*e*) *Disp. infer. Vuln. in Intest. Lethalitat.*

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“ he cannot be fav’d, in whom the jejunum, or any small intestine, has been wounded.” To which our Fabricius ab Aquapendente (*e*), has added the following things: “ I have observ’d persons, thus wounded, to have a very small, and very frequent pulse, and to die on the first or second day; from whence, if you see such pulses, always have a suspicion of the small intestines being wounded.”

As far as it has happen’d to me to observe, in a certain man, in whom a wound, inflicted upon the umbilical region, shew’d the intestine jejunum to have been wounded in its situation; Fabricius has spoken with propriety of the pulses, and justly, also, of the day on which death comes on: although, as I was not allow’d to dissect the body, I could not, for a certainty, determine, whether this was to be ascrib’d to the wound of that intestine alone, or to the wound of the mesentery, and the vessels also; from whence blood had been discharg’d.

Without doubt we must be led by our dissections. And as these show us, for a certainty, what intestines were wounded, so they make us conceive, that the term of life is different in different persons, and that very frequently, from this cause; that is to say, according to the various disposition of bodies, and the different symptoms which are join’d to these diseases. If, in this third section of the Sepulchretum, you read the twenty-fifth observation, which contains most of the examples that relate hereto; you will see, that wounds of the intestinum ileum have brought on death, sometimes within two-and-twenty days (*f*), sometimes within three days (*g*), and at other times within four (*h*): but that wounds of the colon became fatal within as many days (*i*); at one time, and at another within as many hours (*k*): and even that, in a certain person, the intestines, both large and small, being pierc’d with many wounds, these wounds had become fatal on the fifth day (*l*).

Add to these from Hoyerus (*m*); that a wound of the intestine duodenum became fatal on the fourth day; from Bohn (*n*), that a wound of the jejunum was follow’d by death a few hours after; from the same author (*o*), from Uzenbezius (*p*), and from Haller (*q*), that a wound of the ileum was fatal on the eighth day, the fourth day, and the first. To me, however, it had happen’d long before, not to observe a different time of death from that in the man in question, in consequence of a wound in the same intestine, as you will learn from the following history.

33. Another man died convuls’d, in the same hospital, on the day after his having receiv’d a wound, with a knife, about the lower part of the right epiploic region, a little before the end of December, in the year 1726.

As I examin’d, with great accuracy, some parts of this body, and particularly the kidneys, one of which was furnish’d with two ureters, that ran distinctly from each other, and were divided, even at their termination, with-

(*e*) Pentateuch. l. 2. c. 34. in fin.

(*f*) § 9.

(*g*) § 15.

(*h*) § 14.

(*i*) § 13.

(*k*) § 6.

(*l*) § 12.

(*m*) Act. N. C. Tom. 3. Obs. 18.

(*n*) De Renunc. Vuln. S. 2. c. 4.

(*o*) Ibid.

(*p*) Eph. N. C. Cent. 7. Obs. 60.

(*q*) Disp. Anat. collectar. Tom. 7. in fin.

in the bladder; I did not neglect to observe those things which related to the wound. The mesentery was pierc'd through, not far from the termination of the intestinum ileum, but without having any vessel injur'd, in such a manner as to be capable of pouring out a great quantity of blood: nor indeed was there any effusion which deserv'd attention. And even that intestine was wounded.

34. This wound of the intestine prevented me from being so capable of confirming the observations of Frederic Ruysch; though, in this man, there was no effusion of blood to render me doubtful. This author having admonish'd us, in his *Theauri anatomici* (r), "that throughout the mesentery
"are a pretty considerable number of visible nerves, the injuries of which
"produce very violent symptoms, and very great pains;" asserted, in his *Adversaria* (s), that he had often seen men die within two or three days, after continual and intolerable pains of the belly; in none of whom he could find any part of moment injur'd by the wound, besides the mesentery itself, after the most accurate examination was made: notwithstanding the authors, who had written upon these things to that time, had not pronounc'd the wounds of the mesentery to be fatal. Somewhat nearer to the observations of Ruysch, comes that which was related to me by a surgeon of undoubted veracity, about the beginning of the year 1724, in the following manner; and that a few days after it had been made by himself.

35. A foreigner who had resided here for a long time, and was therefore known to every one, receiv'd a wound with a sharp, thin, and two-edg'd sword, which penetrated the abdomen obliquely, on the left side, under the ribs themselves. The narrowness and obliquity of the wound were such, that not only nothing could come out of the wound; but they would not even suffer the probe, by any diligence of his surgeon, or by the diligence of Massieri himself, to be introduc'd into the cavity of the belly: and yet that the wound had reach'd into this cavity, was plain from the following symptoms.

From the time of receiving the wound, quite to the fifth day; on which the pulse fail'd, and the patient died; he threw up the ingesta and bile, continually, by vomiting; if you except an interval of five hours, which happen'd no more than once. He was tortur'd with pains of the belly. The intestines never discharg'd any thing, unless stimulated by glysters. And although blood had been taken away at three several times, and although none of this fluid ever appear'd in what was discharg'd after glysters, or by vomiting; yet, last of all, blood issued from the mouth before death, and at the same time from the nostrils.

On opening the abdomen, under the intestines, which were turgid with air, a small quantity of blood was seen to be extravasated; and that in the lower part of the belly. And the wound had reach'd to the intestine colon, about four inches below the spleen; but had injur'd it only superficially; and from thence, without injuring any other intestine, it had reach'd to the mesentery: which, for this reason, was not only found to be wounded, but tumid.

(r) I. Repet. 3. n. 15. not. 1.

(s) Dec. 2. c. 4.

36. Although, besides the mesentery, the external surface of the intestine was here wounded also; yet you will easily perceive, that this was much more similar to the observations of Ruysch, except that life was somewhat more prolong'd, when you observe with Boerhaave (*t*), "that the external surface of the intestines is, in fact, nothing but the mesentery itself."

However, when death happens from a wound in the mesentery, and you cannot account for this circumstance from the incision of any of its pretty large vessels, as in the citizen whom Bohn (*u*) dissected; you may ascribe it, with Ruysch, to the puncture of these nerves, but of those that are pretty large: for if the puncture of the very small ones were fatal likewise; there would, in my opinion, be no instance of a successful cure of a wound that pierc'd through the belly: or, at least, none that was soon brought about, and unattended with the most violent symptoms; yet this has been said by us, as I have said above (*x*); and others also have seen it: among whom is Waldschmied (*y*).

But our case was a wound with a sword: Mauchartus (*z*), however, having seen the belly pierc'd through by a leaden bullet; in consequence of which, the wounded man died nearly within the space of five hours; enquir'd into the cause of so speedy a death, and found, that the bullet, after having gone through the fundus of the stomach, "had pass'd, from thence, through the mesentery, betwixt the colon and ileum, without injuring either of them, or without rupturing the mesenteric vessels:" and he observ'd, that it was "very little of the contents of the stomach, which had gone down into the abdomen; and that there were, in no part whatever, marks even of an incipient gangrene, or any fatal hæmorrhage:" so that he might have attributed this so speedy death, to the larger nerves of the mesentery being lacerated, if he had not been inform'd, "that no convulsions had come on, previously to death; but that the vomitings had been frequent." Although the internal convulsions of the viscera, perhaps, escap'd the notice of the by-standers.

Certainly, although you have seen it confirm'd, by observations produc'd above (*a*), by me, and particularly by observations referr'd to, in other authors, that wounds inflicted on the fundus of the stomach, are fatal within a short time, for the most part; yet, that this had kill'd, within so very small a space, a man who was so healthy and robust, neither Mauchartus appears to have believ'd, nor do I imagine others will readily believe. But let us return to what I myself have seen.

37. A miller's servant, of one-and-twenty years of age, healthy, robust, and of a very good habit of body, had the same thing happen to him, which happens frequently to young men that are audacious, and full of threats, of which kind he was; I mean, that he receiv'd a wound which prov'd fatal. This was inflicted upon the left epiploic region, with a butcher's knife: as it was then the first watch of the night, he return'd home by himself. In the morning, being brought into the hospital, he was taken

(*t*) Prælect. ad Instit. § 816.

(*u*) De Renunc. Vuln. S. 2. c. 4.

(*x*) n. 7.

(*y*) Eph. N. C. Cent. 9. Obs. 70.

(*z*) Earund. Cent. 5. Obs. 33.

(*a*) n. 9.

under the care of a physician and surgeon. On that day the fever was inconsiderable. But on the following night he vomited, and always trembled with convulsive startings. And continuing to tremble and start in this manner, he died on the following day, in the morning; about the fortieth hour, after receiving the wound.

The body was made use of on the next day, which was the twenty-first, of January, in the year 1738, and on many of the following days, to carry on the anatomical demonstrations, which we had begun to give in the college.

The transverse and oblique muscles of the abdomen, were perforated, in that region which I have mark'd out, with a wound that would admit almost two fingers: and betwixt them the air had enter'd, so that a beginning emphysema was already, in a manner, brought on. This air had got out of the colon; which was wounded, as I shall say just now; into the cavity of the belly, and had distended it. Nor had the air alone come forth from that intestine, but the excrements also: so that, although a fluid was extravasated in the belly, to the quantity of two pounds; the greatest part of it was made up of excrementitious matter, and very little of it of blood; no considerable vessel having been injur'd.

For the knife, having pierc'd through the abdomen, as I have said, had pass'd on obliquely upwards, and inwards: and first, indeed, had incis'd the corresponding part of that intestine, which I have mention'd, in such a manner, that the anterior and posterior surface of it, and that which is turn'd towards the vertebræ laterally, being cut asunder, gave a passage for the air and excrements to be discharg'd into the belly.

After that, the knife had, without hurting the kidney, or the appendix of the diaphragm, pass'd through the *musculus quadratus lumborum*, and had penetrated, beyond this, into the common beginning of the *sacro-lumbus* and *longissimus dorsi*, in such a manner, that of the tendons, which ascend obliquely from this beginning, to the transverse processes of the lumbar vertebræ, one only was incis'd; and that not entirely; but what you know to be much worse, was cut into only in part. From hence, therefore, perhaps most persons would have deduc'd the principal cause of the man's being carried off by convulsive startings; especially, as the wounded intestine was not red, or livid, in that very part where it was wounded.

The fundus of the stomach, when inspect'd on the internal surface, show'd the small vessels to be distended with blood here and there, for some space. However, the liver was large, and very long transversely; so as to be extended almost into the whole hypochondrium on the left side. The spleen was also pretty long, and bigger than it naturally is; and the artery thereof, was not only very small, in proportion to the magnitude of that viscus in particular, but very little tortuous also. For I was less surpris'd at the thinness, as I observ'd the trunk of the great artery to be, in that part, as well as in the thorax, very narrow; and not only in proportion to the body, but also in proportion to the vena cava itself; the foramen of which, in the septum transversum, was the largest of all that I ever remember to have seen.

Upon opening the thorax, I found the lungs every where free and un-

connected; which, you know, happens but rarely in adult persons: but they were furnish'd with bronchial glands, of a larger size than usual, so that one was almost equal in magnitude to a small nut, when compress'd. In the pericardium was a yellowish water, and that not in very small quantity. The heart was rather large, and therein was blood, which, like the blood in other parts, was black; but there it was, also, in some measure grumous. The great artery, beyond the curvature, shew'd some kind of furrows, as it were, drawn on the internal surface, and in a longitudinal direction.

The other circumstances that I have observ'd in this body, do not relate to the present subject.

38. Although you have had a great number of observations, in this letter, in regard to wounds of the stomach, the intestines, and most of the other viscera which are in the belly, from Valsalva, from me, and from other observers; yet I will refer to others, in several authors, which you may, if you please, insert into the Sepulchretum.

To wounds of the larger intestines, that is, of the colon and the rectum, relate the observations of Harderus (*b*), and Bautzmannus (*c*). In the latter is, at the same time, what relates to the diaphragm being wounded; and in the former, what relates to the receptaculum chyli; if I rightly understand it; but, at least, what relates to the kidney being wounded at the same time: mention of a wound in which part is also made in the preceding letter (*d*). Now we shall add the observation of Laubius (*e*), which is so much the more worthy of attention, because the knife had reach'd through the middle of the spleen quite to the left kidney. And there will be another of the spleen from Bernerus (*f*).

Moreover, besides those examples which are pointed out in the latter end of the preceding letter (*g*), as relating to wounds of the liver, Bohn (*h*) will give you others, which have still more reference to the subject of this letter. And in none of the viscera of the belly are deep wounds more certainly, and more speedily fatal, than in this viscus; not only by reason of the multiplicity of its vessels, but also by reason of its greater thickness, the nearer it approaches to the diaphragm.

Wherefore Homer (*i*) has, with great propriety, said of Eurypilus throwing his lance: *Pervast hepares subter præcordia: statim autem genua solvit*: and in another place (*k*) of Patroclus: *Percussit ubi mentes fingunt circa prudens cor; cecidit autem*: in which passage, by reason of the word *fingunt*, there is some resemblance to a commentary which we have in the book *De Morbo Sacro* (*l*).

And lest you should here think that I digress to the poet, contrary to the custom of the ancients; see what Galen (*n*) has observ'd in regard to that passage of Homer (*m*), which relates to Ulysses and the Cyclops, *Ubi mentes hepares habent*. "So speedy and violent a death," says he, "follows the wound or the laceration of this vein," that is to say, the cava, where it

(*b*) Eph. N. C. Dec. 3, A. 9, & 10. Obs. 62.

(*c*) Ibid. Obs. 234.

(*d*) N. 40.

(*e*) Eph. N. C. Cent. 10. Obs. 8.

(*f*) Aët. N. C. Tom. 2. Obs. 69.

(*g*) N. 41.

(*h*) C. 4. supra ad n. 36. cit.

(*i*) Iliad. l. 11.

(*k*) Iliad. l. 16.

(*l*) N. 18.

(*m*) Odyss. l. 9.

(*n*) De Usu Part. I. 4. c. 14.

connects the liver, into the substance of which it is fix'd, to the diaphragm, "that when the poet says, the very wise and prudent Ulysses lay in wait for the huge Cyclops, and contriv'd how to take away his life, he determin'd not to force his sword into any other part-of the body, but that where the liver is contain'd in the diaphragm: so confident was he, in respect to this place, that if it was affected with a wound, it would not suffer him to live even a moment of time."

But Riolanus (*o*) also commends Galen, for producing this testimony of Homer: although, through forgetfulness, he asserts that Ulysses really did what both of them say he intended to do.

And whether from a wound of the gall-bladder, an equally speedy and sudden death is to be expected, has been sufficiently shewn by me in the second of the *Epistolæ Anatomicæ* (*p*); as I have consider'd all the examples, which had been produc'd quite to that time, of rupture in this part, and not only from a wound, but from any cause whatsoever. I remember to have read only one or two that have been added since that time; one of which you may examine in the works of the very illustrious Van Swieten (*q*).

You will see, indeed, what symptoms, which were very considerable, succeeded to the wound of the vesicle, and the effusion of the bile into the cavity of the belly, both immediately and after some days; but you will, at the same time, see that death did not come on before the beginning of the seventh day. Yet this did not happen by any means in the other example, which the celebrated Tacconus (*r*) has produc'd; but the woman, in whom was an abscess of the liver, which was grown into one substance with the peritonæum, and had ruptur'd the cyst, recover'd perfectly.

And, indeed, I see that Kaltschmidt (*s*) agrees with Bohn (*s*) in this opinion, that life may be extended for some length of time without the cystic bile: nay, he even thinks that this bile, when effus'd within the abdomen, does not, of itself, bring on any immediate danger.

On the other hand, there is not the least room for doubt, but, if the other bladder, that is, the urinary reservoir, be so wounded as to discharge its contents within the cavity of the belly, that the most violent and fatal injuries are the consequence thereof; as is likewise the case, when the ureters are wounded. For the urine does not always entirely come out by the external wound, where the bladder is open'd, till it begins to be excreted by the urethra (which it could not be at all in the beginning); as happen'd in the cases observ'd by Ruysch (*t*), by Bohn (*x*), and by Martinus (*y*).

Sometimes, indeed, the wound is not inflicted in an opposite direction, but on the back-part of the bladder; as in the third history which is produc'd by Bohn (*z*), in which the side of the bladder was perforated; and, in like manner, as in that servant-maid, of whom Alexander Camerarius (*a*) speaks,

(*o*) Anthropogr. I. 1. c. 2.

(*p*) N. 96.

(*q*) Comm. in Boerh. Aph. § 312.

(*r*) De radiis quibusd. Hepat. &c. Observ. n. 3.

(*s*) C. 2. cit.

(*t*) Delect. de Vuln. Hepat. § 48.

(*r*) Cent. Obs. Anat. Chir. 75.

(*x*) C. 4. cit.

(*y*) Commerc. Litt. A. 1751. Sept. 21.

n. 3.

(*z*) C. 2. cit.

(*a*) Ast. N. C. Tom. 1. Obs. 160. 1756. f. 1.

in whom a leaden bullet had pass'd through the middle substance of the uterus, and from thence also through the middle of the bladder.

We, therefore, come at length to the uterus, other examples of which being wounded you will meet with, besides this instance; particularly in gravid women, in whom, in proportion as it lies more easily open to wounds, so the wounds are attended with more danger. There is, among the chirurgical disputations collected by Haller, one in particular, I mean the hundred-and-thirty-first, in which (*b*) you will find some observations relating to this subject.

But whatever viscus is wounded, although each has its peculiar marks to judge by, and in particular that which anatomy supplies us with; I mean, the knowledge of its proper seat; we must, nevertheless, be cautious, lest we are at any time deceiv'd by this very circumstance, being unmindful of the varieties which frequently occur; as in case of the uterus being inclin'd to one side; or in case of the intestine colon, in particular, being inflected from that transverse situation, which it is wont to have in the upper part of the belly, more or less downwards: or in the liver, of which, if I have not told you in these letters what I have seen differently in different persons, yet I have in the first of the *Epistolæ Anatomicæ* (*c*); as also in the second of the *Adversaria* (*d*), where I have not conceal'd what it behoves us likewise to suspect, in some persons, in regard to the stomach.

But suppose that the several viscera should always keep the same situations; as the diaphragm is higher at the time of expiration, and lower at the time of inspiration, does not the liver, in particular, and the stomach, follow the situation of the diaphragm, and therefore descend more when we inspire very strongly? When we stand upright, when, from fasting, the viscera which support the liver are empty, the fulcrum of the diaphragm is also wanting, which resists its descent; as I have said to you already in a former letter (*e*), in respect to the opinion of more than one, both of the ancient and modern authors: to whom you may moreover add those celebrated men Winslow (*f*), and Van Swieten (*g*), who do not doubt but this is confirm'd by the observation of the celebrated Garengot on the liver of a man, which was wounded while in this state.

All these things, therefore, and others of the like kind, it is necessary to attend to: and if there be any doubt remaining after that; with the knowledge of the more general situation, join other tokens taken from the action and the office of each viscus, and from the nature of those fluids which they contain.

In the same manner, the blood-vessels discover themselves, when wounded, by their blood being in great quantity, if they are large, and there is no obstacle to its profusion from the cavity of the belly; and by its being in very great quantity, if the vessel is very large; as, for instance, if the aorta or vena cava be wounded: although, in such a case, life ceases before we can have time to distinguish.

(*b*) C. 1. § 15.

(*c*) N. 2. 11. & seqq.

(*d*) Animad. 2.

(*e*) 26. n. 25.

(*f*) Expof. Anat. tr. du bas Ventr. n. 267. & seq.

(*g*) Comm. in § cit.

You have an observation from Helwich (*b*), of a considerably large artery, that is, of the splenic, being wounded; and of the aorta being perforated (without the intestines, which lie before it, being injur'd) at the very division into the iliacs, from Dillenius (*i*). And you may read examples of the vena cava being wounded, in the Sepulchretum, from Hildanus (*k*), and Paaw (*l*): and thereto you may add an example, from Bohn (*m*), of the internal iliac vein; from which you yourself will perceive what may often be an obstruction, for some space of time, to the blood which is about to flow, not only from the cavity of the belly, as I said a little above, but even from the vein itself which is wounded. To return, however, to my observations which relate to wounds of the belly: as the last of them was that which I took from a young man that was servant to a miller; now take some which relate to blows and compressions of the same part.

39. Another miller, but this an old man, falling down upon a stone, hurt the very side of the right epiploic region. For which reason, and because he then, by means of coughing, expectorated blood, though in a small quantity, he came into the hospital. More than fifteen days being elaps'd, and he in the mean while making scarcely any complaint, and staying there only on account of his poverty and feebleness, as it were, said, upon being ask'd, that he was coſtive in his bowels.

He had, at first, ſolutive clysters adminiſter'd to him, which, however, return'd without any effect. After this, he ſaid that he had pains in his belly, and that his abdomen had lately become turgid and tenſe, like that of a tympanitic perſon: in the morning, therefore, an ounce of that medicine which is call'd diatartarum, was given him. This, however, had no effect; except that, on the following night, the old man diſcharg'd a great quantity of blood into his bed, without knowing what he had diſcharg'd: and, at the ſame time, he threw up from his ſtomach what he had taken in by way of ſupper. Soon after this, he was ſeiz'd with a deliquium, and ſoon after that with death, which happen'd on the ſame night; that is, a little before the end of November, in the year 1743.

The abdomen was not only tumid, at about the ſpace of three days from the time of death, but even at the thirtieth hour from thence; and it was already externally green, moreover. Upon the opening of this cavity, much water was found within; although in the feet there was not the leaſt beginning of an œdematous tumour. This water being exhausted, the remaining parts were left in that ſtate for ſome hours, by reaſon of the very filthy odour they exhald. And when theſe hours were elaps'd, the internal ſurface of the peritonæum, alſo, was become green.

Then re-examining, with more diligence, thoſe things that had before occur'd to the eyes, I ſaw the omentum to be univerſally drawn up to the ſtomach; this laſt-mention'd viſcus not being at all diſtended: yet the ſmall inteſtines were very much diſtended, particularly the ileum, and that in the laſt turns thereof; to appearance, from the air which was included therein.

(*b*) Eph. N. C. Dec. 3. A. 9. & 10. Obſ. 120. feb. A. 1658.

(*c*) Dec. cad. A. 7. & 8. Obſ. 165.

(*i*) Scſſ. l. 3. Obſ. 25. § 15.

(*l*) Ibid. § 15.

(*m*) De Renura. Veln. Scſſ. 1.

The extremity of the same ileum, and the beginning of the colon, were of a bright red colour, inclining to brown: whereas the neighbouring cæcum, the appendicula vermiformis, and the remaining part of the colon, were of a natural colour; and the whole left part of this intestine, and the rectum, were very much contracted.

Yet that portion of the abdominal muscles, which had been in proximity with the beginning of the colon, appear'd to be black and livid on the internal surface, as if from contusion. But neither this, nor that part of the intestines, which I said was of a preternatural colour, had any thing hard or tumid in them. We could not examine the internal surface of the intestines, by reason of the very disagreeable and almost intolerable odour. The liver was pallid: the spleen was larger than it naturally is: the glands of the mesentery were not so small as to make it necessary to open the fat in order to bring them into sight.

In both the cavities of the thorax was no very small quantity of reddish water: in the pericardium was more than usual; but it was not in so great a quantity as the former, nor of so red a colour. The left lobe of the lungs was, in some part of it, connected with the pleura; yet both this lobe and the right were sound.

Upon opening the cranium, and removing the dura mater; under the pia mater, in some places, were observ'd a few air-bubbles, and that appearance of a kind of jelly also. The vessels which creep through this membrane were most of them distended with blood; but still more those which run on the sides of the septum lucidum: and, indeed, from the substance of the medullary part of the cerebrum, drops of blood were prominent, as we cut into it. And these appearances I attended to so much the more, as I had observ'd a smaller quantity of blood than usual, in the larger vessels of the belly and thorax. There was no water in the ventricles of the cerebrum, and the substance thereof was itself sufficiently firm: but I found the cerebellum to be very lax, and the pineal gland still more so; though these parts, and others, which it is not necessary to mention here, I did not dissect later than on the fourth day after death.

40. This man, indeed, died very late from a blow of the abdomen: but another, in this city, very soon; and, as I suppose, about the year 1670, when Jacob Sandri, whom I have already mention'd to you, as one of my preceptors at Bologna, was here upon his studies. What he related to me, I shall give you in just as many words.

41. A certain man being struck on the navel, by the kick of a horse, fell down dead immediately, like an apoplectic person. When he was dissected, there was no other preternatural appearance but a lividness, and blackness, of the intestines corresponding to the part which had been struck.

42. Upon hearing this relation, when I was a young man, the observation of Hildanus (n) came into my mind, of a young man falling down soon after having the umbilical ligament of the liver cut through, and dying very soon. But afterwards; when I observ'd that neither reason, nor the greater part of authors, ascrib'd great effects to the injuries of this ligament; I set aside that

thought, and happen'd to light on another, to which the observations of Bohn (*o*), and others whom he quotes, and some of Benivenius (*p*) besides, seem'd to lead me: I mean of blows on the abdomen, causing a sudden prostration of strength in those who receiv'd them, and even suddenly killing; by reason, as he supposes, of the very violent concussion and convulsion of the diaphragm, from whence suffocation and asphuxia may be brought on.

However, as the blows, of which he speaks, do not relate to the navel, but to the epigastrium; for this very reason, and some others, I myself withhold my assent: but you are at liberty to think as you please.

43. To violent compressions of the abdomen would relate, in preference to others, that which the carman suffer'd from the wheel of a cart being driven over his belly; from whence the most considerable inconveniences, and the largest aneurism of the great artery, that I have ever seen, proceeded; if I had not describ'd this history to you already in the fortieth letter (*q*).

But in regard to wounds and blows of the loins; whereto belong the observations of those celebrated men, Verdriesius (*r*), and Quelmaltz (*s*); as at present I have none of my own at hand; and as I have more than one of those that relate to wounds, or compressions, of the limbs; I will pass over to these.

44. A rustic man, who had a pretty good habit of body, being at work about wood, fix'd several splinters of it very deep into the palm of his right hand; the wound corresponding, pretty nearly, to that interstice which is betwixt the bones of the metacarpus, that lie under the fore-finger and the middle-finger: nor did he show the wound to any surgeon, or physician, till after he was seiz'd with convulsive motions of that whole limb.

Therefore, on the eighth day, from the time of receiving the wound, he was at length brought into this hospital. Blood was then first taken from his left arm; fresh-drawn oil of almonds was given him; oil of turpentine was applied to the wound; the right limb, and the spine, were anointed with such liniments as are useful against convulsions; and some splinters of wood were extracted from the wound; but all was in vain: and that not only for the reason which I shall give you just now, but also because the effects of a disorder, which was entirely neglected for so long a time, had become very deeply rooted in the habit; and the whole limb was manifestly drawn upwards, by very frequent convulsive motions.

Wherefore, within forty hours, from the time of his being brought thither, he died: and this was at a time when I was demonstrating the structure of the human body to the pupils there, on other bodies; for it was now near the end of November, in the year 1742; I therefore made use of this also. But at present I will, according to my custom, pass over other things; and will take notice only of those that relate to the wound, or to appearances not quite natural.

The hand and the arm were not very tumid. The wound had a narrow orifice; and the shape of it was nearly circular: and so deep was it, that it

(*o*) De Renunc. Vuln. S. 1. & S. 2. c. 3.

(*r*) De Abdit. & c. merbor. causis, c. 110. in fin.

(*s*) n. 26.

(*r*) Act. N. C. Tom. 1. Obs. 26.

(*s*) Dissert. de Pirquet. § 17. in fin.

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came through that interstice of the bones, which I have spoken of, almost to the back of the hand: the tendinous expansion of the pulmaris, the adducens muscle of the thumb, which lies beneath it, and the interossei, not to say the lumbricalis, being perforated; the tendons of the muscles that bend the second and third joints of those fingers, as well as the nerve which ran, as I saw, on the side of the wound, being moreover certainly injur'd, as you will understand from those things which will be immediately said.

For while we examin'd the wound thoroughly in the dead body; with such freedom as it was impossible for the surgeon to make use of in the living body; we found a fragment of the wood, of the form of a parallelopiped; slender in its shape, but longer than the point of the little finger, in its transverse direction, though not so broad by one half; so deeply buried, and so wedg'd and fix'd in, that it could not be got out without difficulty, nor without doing violence to the tendons of those flexor muscles which I have mention'd.

You see plainly then, that these tendons were much affected by the entrance of that fragment; and that, after it had enter'd, by confining the pus, which was discharg'd from the wound in but small quantity, and almost like ichor, it had render'd it more acrid from stagnation, and, for that reason, more fit to vellicate those tendons, or at least that nerve, while it was slowly and gradually distill'd.

The veins, both internally and externally, were, in several places, distended with black and fluid blood: and this it was easy to observe, as we dissected the thorax, the neck, and the head; and from thence it was very easy to know, that the cephalic vein was wanting in the left arm, not only below but above the elbow, except that, above, a very slight and slender resemblance of it was found, at length, with some difficulty, and by means of a very accurate and attentive dissection.

The head being cut off from the vertebræ, no water flow'd out from the tube thereof: and none of this fluid, in like manner, was in the ventricles of the cerebrum; in which the plexus choroides were, as I saw, of a brown colour mix'd with a great redness: and I saw a great number of sanguiferous vessels here and there, during the dissection of the medullary part of the cerebrum, which had the same appearance. But the cerebrum, and the cerebellum, the medulla and the nerves, were of a proper firmness.

45. While I was describing to you these very violent and fatal convulsions, which succeeded to a deep wound of the hand, they brought to my mind those that came on after a very slight wound of the forefinger; which of themselves, indeed, were not so violent, but seem'd more considerable than they really were, not only on account of those symptoms which they had join'd with them, but by reason of the little animal that gave the wound, from whose bite nothing of this kind was expected.

A noble virgin of Verona, of sixteen years of age, having, like Lesbia, that fellow-citizen of hers in Catullus (*), a sparrow which she fed, and with which she play'd; endeavouring one day to take it from her right shoulder (on which it had happen'd to hop) with her left hand, the mischievous little

(*) Carm. 2. & 3.

animal bit her fore-finger with a very violent stroke of its beak, and wounded it, on the external part, in the very joining of the first and second internode. It was plain, from the appearance of the finger, that some nervous part was wounded, besides the common integuments; for it was immediately bent, and could be no more extended, or mov'd: and for that reason it became less movable soon after, when pus was form'd in the wound, the pain being encreas'd, and the hand also becoming contracted and swollen.

To these symptoms was added a fever of some days. Which fever, however, as well as all the symptoms I have mention'd, together with the swelling of the hand and finger, were remov'd, to all appearance, by a speedy and happy cure. But scarcely had they brought about this cure, when, lo! on the fourteenth day from the time of her finger being wounded, a sudden tremor, which began first in her feet, and soon after in her hands, and was from thence propagated through the whole of her body, seiz'd upon the virgin, and brought with it a dangerous and long syncope: on the going off of which her tremors did not for that reason go off; but being join'd with a groaning, and sometimes with a kind of howling, continu'd many hours: till at length opening her eyes, and relaxing the lower jaw, which was forc'd closely against the upper, she return'd to her senses, being quite ignorant of all that had pass'd.

But after a very short interval, all these symptoms return'd again in the same order, more slightly indeed, and for a shorter time; but were so frequently troubling her, that every day sixteen or twenty attacks were reckon'd up. And now this had been the state of the case for six days, when I was consulted, by letters relating these facts; which letters bore date the last day of August, in the year 1743. I was not very well pleas'd, upon calling to mind the aphorisms of Hippocrates (*t*), that the fever had, in this case, been put to flight by the Peruvian bark; and that the wound had been so soon brought to a cicatrix: as I remember'd that it was the opinion of Celsus (*u*), according to the reading which, as I have shewn in a former work, ought to be retain'd (*x*), "that almost every bite has some virus;" and that Matthias Tilingius (*y*), Jo. Georg. Sommerus (*z*), and, before these, John Schenck (*a*), had been of the same opinion, on account of the very violent symptoms which succeeded the bite of a goose, and of a cock likewise: the latter of these authors from the observations of Baccius, the former from their own.

However, as we observ'd that all these bites had been applied to the hands or to the fingers, (as in the case in question) parts which, either because they are furnish'd with so many tendons, or from any other more just cause, are certainly often liable to considerable and violent disorders, even without any virulent infection, when lacerated and contus'd; I gave such an answer to the letter, as, whether the paroxysms had taken their origin from the too hasty occlusion of the wound, or, on occasion of the wound itself, had had

(*t*) S. II. 26. & IV. 57.

(*u*) De Medic. I. 5. c. 27.

(*x*) In Cels. Epist. 1.

(*y*) Eph. N. C. Dec. 2. A. 2. Obs. 75.

(*z*) Dec. ead. A. 10. Obs. 82.

(*a*) Obs. Medic. I. 7. S. 1. Obs. 13. in fin.

the same origin as in hysterical persons (for the virgin was of a sanguineous temperament, inclining to melancholy, and full of juices, and yet did not discharge a sufficient quantity of blood every month from the uterus, in proportion to the quantity of her humours); I say, I gave such an answer as recommended what seem'd to me the most proper methods to be taken. But whether by the help of these methods, or by the strength of nature, and increasing age, all these symptoms were carried off; it is at least certain, that I heard no more complaint of these disorders afterwards.

46. A wool-comber quarrell'd with another wool comber, who was, I believe, his uncle, either by the father's or the mother's side; but certainly a relation. Both of them were heated with wine, which they had drank in great plenty, as most of the common-people are wont to do here on the eleventh of November; for that was the day, in the year 1745. In the night-time, at length, they went from words to blows. The first happen'd to fall down; being lame of his right side. The other wounded his thigh, as he lay, with a knife, and even pierc'd it through. For the point of the knife, entering a little above the knee, on the anterior and internal side, had come out again on the posterior and external side. A great effusion of blood was instantly made from the wound at both orifices; and this hæmorrhage, as it was an unseasonable time of night, not only could not be restrain'd by those who were about him, but could not even be prevented from carrying off the man, when brought into the hospital, within six or seven hours.

The body being lean, but within the bounds of health, was proper for the prosecution of our anatomical studies: and the time of the year was not unsuitable. Wherefore, on the twelfth and on the following days, we dissected it with accuracy. But some things that I observ'd I have refer'd to other writings; and the cause of the lameness itself, which I plainly saw, to another letter (b).

We will now add what remains. And, first, upon opening the wound carefully, the cause of so great an effusion of blood came into sight. For we found that the crural artery, where it goes to the ham, and the attendant vein, were, in great measure, cut transversely.

In the belly, moreover, the omentum, which was moderately fat, was drawn up to the stomach, both on the left and right side. The stomach was full of wine; yet no chyliiferous vessel was found creeping any-where through the mesentery or intestines. The small intestines, except the duodenum alone, were of a brown colour inclining to cineritious: that part of the colon which passes transversely, in the whole of it, and a portion of the parts that lay nearest to it on both sides, were contracted almost to the size of a man's thumb.

The gall-bladder was also contracted; and this appear'd, not only from the small quantity of bile which was in it, but also from the cavity which was hollow'd out in the liver to receive it: for though this should have corresponded to the vesicle in latitude, it was much wider than the vesicle. The kidneys were pretty large; the spleen was small, and of an unusual kind of

figure, yet not less found than the kidneys; except that, while I cut into it, it seem'd to me to be somewhat more firm than it ought to be.

In the thorax, the lungs, which were in other respects found, had so collaps'd into themselves, that I scarcely remember to have seen any that were less extensive in their bulk: but the right lobe was most collaps'd, as it was connected only, at its upper part, by a lax, and not very broad, membrane, to the pleura; whereas the side of the left lobe was, in great measure, very closely connected to the pleura. That they had thus collaps'd, and yet were, if you except the posterior surface, as in propriety we ought, of a cineritious colour inclining to white, was owing to the very small quantity of blood which we observ'd to remain in the larger vessels, both of the belly and thorax; for the muscles were, in other respects, of a very beautiful colour. And even the heart was quite depriv'd of blood; so that in the right auricle was nothing more than a very small coagulum. This inclin'd to the nature of a polypous concretion; whereas all the blood which was contain'd in the several other parts of the body, was fluid.

47. If a skillful surgeon could have been at hand immediately upon the infliction of the wound, by applying the tourniquet, and constringing the femur, above the wound, he would, at least, have preserv'd the patient so long, as to give time to consider of amputating the limb. For the transverse incision both of the artery and of the vein, in great measure, would have render'd ineffectual the other methods of cure, which are not only prudently propos'd by the celebrated Heister (c), but also have been successfully put in practice, when this artery was wounded almost in the same place, though in a longitudinal direction.

Nor could an incision of this kind, join'd with so great a fluidity of blood, afford us even the miserable hope that the gruinous blood (as you will find, from the Sepulchretum (d), that Bartholin had seen in a case of this kind) should stop up the wound for some days by its coagulum.

However, in regard to the cure of wounds of the vessels, in whichsoever limb they may happen; when they admit of other cures, or when they admit only of amputation; read the many observations produc'd by John Bohn, in his book *De Renunciatione Vulnerum Lethalium* (e): and you will not wonder that this very great man is so often commended by me in these letters, when you observe either the number of the examples that he has given, or the perpetual silence that there is in the Sepulchretum in respect thereto; or, finally, when you know what I owe to his memory, who, besides other acts of friendship, when he was an old man, sent this book to me with great kindness, together with his other books, at the time I was but a young man.

48. To violent compressions of the lower limb seems to relate the case of a certain young man, who died in the hospital of St. Mary de Morte, and was dissected when I happen'd to be at Bologna, in the beginning of the month of June, in the year 1709.

49. A young man, of two-and-twenty years of age, having the wheel of a cart pass over almost the lower part of the left heel, seem'd to have receiv'd

(c) Differt. de Arter. Crural. Vulner. n. 6.
& seqq.

(d) Sect. hac 3. Obl. 26. § 8.

(e) Sect. 1.

no other disadvantage from it but this, that the common integuments were torn away. While the cure of an injury which appear'd slight went on very well, behold! after some days, the neck and the back become rigid; so that, as if he had been seiz'd with a kind of tetanos, he could move his limbs indeed, but could not move either his neck or his back. To this was added, that, at intervals, he was shaken by the most violent tremors of the whole body. And all these symptoms going on, in this manner, for twenty days or more, his senses being always perfect, he having thrown up a round worm by vomiting, and the stertor being much increas'd, he died.

The foot being examin'd about the evening of that very day on which he died, the heel was found to be almost heal'd.

The abdomen, which was turgid, being open'd, a small quantity of water was seen to be extravasated therein; all the intestines, and the stomach itself, being found, but distended with air, to a very great degree. Within the colon, near to the appendicula vermiformis, was a round worm dead.

The thorax also had a small quantity of water effus'd in its left cavity: the lungs of that side were hard posteriorly, and of a substance like that of the liver. There were polypous concretions in the large vessels, and in the ventricles of the heart; in the right of which cavities there was blood also, together with airy bubbles.

Upon opening the cranium, in the right lateral sinus of the dura mater was coagulated blood; in the other was seen a fluid blood, not without some pretty large bubbles. There were many bubbles also under the pia mater, especially about the left anterior lobe of the cerebrum. Under the same membrane was water besides; the taste of which water seem'd, to one who was willing to taste of it, to be nothing at all, or at least nothing more than a slight saltness. In the ventricles of the brain was a pretty large quantity of water. And no small quantity was discharg'd from the tube of the vertebræ, especially when I order'd the loins and the os sacrum to be rais'd up. The cerebellum was lax, the cerebrum was firm: and the sanguiferous vessels, that crept through the ventricles of the cerebrum, and the plexus choroides, were not at all of a white colour.

50. What Vallesius (*f*) thought of that young man of Hippocrates, who had run through a rough way, and who had, from thence, "a pain in his heel, especially at the lower part;" which part, and the neighbouring parts about it, becoming black, "he liv'd in all but twenty days after "having run thus;" and what, in like manner, Augenius (*g*) thought, when he was speaking of many persons who had perish'd from slight wounds, and particularly of M. Sobririatus, "who, contrary to the expectation of all, "died on the fourteenth day after a very small wound was inflicted on his "heel;" I mean, that from slight external causes of this kind arises no more than the occasion of the disease; but from the bad habit of body, and from the malignity of the juices, arise the violent symptoms, and even death itself; will certainly seem to you reasonable to be determin'd in this case: and this so much the more, as the worms, and the very quick extrication of

(*f*) Comment. in l. 5. Epidem. n. 47.

(*g*) Tom. 1. l. 9. Epist. Medic. 2. vel potius 3.

the air-bubbles from the blood and humours, may be consider'd as marks of the deprav'd disposition of those humours, or, as the ancients spoke of it, the putrefaction thereof.

Indeed, I do not despise tokens of this kind taken from Hippocrates himself (*b*), where he has said, "that men die from wounds of every kind, and such as are in no respect considerable; nor need we be surpriz'd at this - - , when we consider that - - - the bodies of men differ so much from each other." And, besides, you know that I am not ignorant of this saying of Valerius, as I have spoken of it to you on a former occasion (*i*): "the end of our life being expos'd to various and occult causes, they sometimes, undeservedly, bear the reproach of being fatal; whereas they happen rather at the time of our death, than are themselves the causes of it." Finally, in this very letter (*k*), when I related the case of that virgin of Verona, which was follow'd by violent symptoms, you might see how much I ascribe to tokens of this kind.

Yet if any happen, either in this case or that, to consider both the nature of the part, which was wounded by the external injury, and the kind of symptoms which have come on; that is to say, convulsions, from whence most of the circumstances of disease, that happen'd not only in that virgin, but in this young man, might arise; for the vessels being constricted here and there, and the motion of the lymph and the blood being retarded for a long time, not only a syncope, but extravasations of water, and inflammation of the lungs, are easily brought on; if any one, I say, in consideration of these things, should chuse rather to ascribe somewhat more than the occasion of these morbid affections to the cause which is accidentally applied from without, I shall not contest it with him very obstinately. Farewel.

LETTER the FIFTY-FIFTH

Treats of Ulcers and Sphacelus,

1. **A**S the beginning of the section which is thus entitled, and is the fourth in this fourth book of the Sepulchretum, begins with the consideration of *Achores* and *Tinea*; it does not sufficiently appear, why those observations, also, of *Lepra*, *Pfora*, and of *Tinea* itself, some of which you will at length find in the beginning of the eleventh section, and one near

(*b*) Prædict. l. 2. n. 19. & 20. apud Marinell.

(*i*) Epist. 26. n. 14.

(*k*) N. 45.

the end of the twelfth (*a*), are not comprehended therein. And the reason, certainly, was not left this fourth section should be more prolix than it ought to be; for those observations which are referr'd to other places, are few, and this section is short; especially if you take away the scholia, and out of thirteen observations, which are propos'd under number ten, you observe that ten have already been produc'd in other places, and that one out of this very same number has been set down twice over here (*b*). Which circumstances I was willing to take notice of, lest you should be surpriz'd, that I, who am determin'd to make no repetitions, should have scarcely any to relate in the present letter.

2. For that I also may begin with achors and scabies: if you should desire to know what appearances were found by Valsalva, or by me, in bodies that had been infected with these disorders; you will readily find them in the tenth (*c*), the sixteenth (*d*), the thirty-eighth (*e*), and the forty-first letters (*f*), and in others. In reading of which over again, I would have you observe, that, in consequence of these little ulcers being dried up, either of themselves, or by any kind of unctions whatever, an infant perish'd by convulsions; a virgin, by a dropsy of the thorax and pericardium; a woman, by an acute fever and tympanites; and a young man, by a suppression of urine: and that the causes of death had arisen from the occlusion of the little ulcers; for, as when open and discharging they kept off diseases, or, as was manifest in the infant and the woman, even remov'd them; so when dried up, they retain'd in the blood those stimulating particles, and noxious humours, which were before eliminated and discharg'd thereby; and which were soon afterwards effus'd, in almost all of them, either betwixt the meninges, or into the belly, or into the thorax, which I found to be full of a blueish water in the virgin whom I have mention'd.

In the beginning of the eighteenth letter (*g*), you will also light on the history of a shoemaker, whose body was cover'd over with a very small scabies. And there consider over again with yourself, I beg of you, that if any one should have attempted to drive this away by an unction, how much more he must have increas'd the diseases of the relax'd and extenuated paries of the left ventricle of the heart, and of the great artery annex'd thereto; which was, internally, ash-colour'd and unequal: and that by confining those erosive particles. This you will believe the more readily, if you now call to mind what happen'd to Trombelli (*h*) from having a herpes repell'd.

Moreover, you will see, that with these observations of Valsalva, and with mine, agree what are advanc'd in the beginning of this fourth section of the Sepulchretum: in one observation, for instance (*i*), on a prince of two years old, in whom the achores having entirely vanish'd, a bloody water, and in considerable quantity for so small a body, was found under the cranium; and in another (*k*), taken from a woman, who having been cur'd of the tinea by lotions, had one hemisphere of her brain putrid, and fill'd

(*a*) In Additam. Olf. 6.

(*b*) § 6. & 8.

(*c*) N. 9.

(*d*) N. 34.

(*e*) N. 22.

(*f*) N. 4.

(*g*) N. 2.

(*h*) Epist. 26. n. 39.

(*i*) Obs. 1. § 1.

(*k*) Ibid. § 2.

with a citron-colour'd ichor. To which if you would have others to add, they will not be found wanting; and in particular two, the one from Schulzius (*l*), showing, what, and how many disorders of the viscera succeeded a very considerable humid, and long-continued scabies, when repell'd by an external remedy; and the other from Lanzoneus (*m*); which shows, that diseases were found in the brain, the diaphragm, and the liver, when an acrid tinea, and a foul scabies, had been remov'd by unction.

3. But even without the dissection of dead bodies, what physician is there who has not seen internal, or external, disorders, often arise from the retro-pulsion of a scabies, or of achores? you remember that Valsalva was consulted in regard to a tumour (*n*), which, whether it was a real exostosis of the knee, or only bore the appearance of it, had certainly succeeded to the cause whereof I am speaking. And what external or internal disorders Gerbezius (*o*) saw from the same cause, and among these disorders malignant fevers; which Lanzoneus (*p*) observ'd more than once, and those of a fatal consequence; and, in like manner, that Dethardingius observ'd an asthma (*q*), and Cummius (*r*), who is refer'd to by him, an apoplexy; you will learn from inspecting their observations.

It would be very easy to add a great number of others, either if there were occasion, or if I were not about to take notice of them below (*s*). Wherefore, though I could also produce a great number of my own observations in this place, I will give you no more than two, and those made both in one month; I mean in February, of the year 1710, on two noble fellow-citizens of mine.

In one of these gentlemen, little ulcers of the head, just like those that we call achores in infants, had been dried up by the injuries of the nocturnal air; when, scarcely eight days having pass'd from that time, he was seiz'd with a malignant fever, attended with vomitings, and finally with a singultus: in which fever; although the pulse was very weak, and other bad symptoms were not wanting, besides those that I have mention'd; he, nevertheless, always seem'd to himself to be in good health: for this reason, his physician, who was a man of age and experience, was not call'd in till late; when, notwithstanding he did whatever lay in his power, and notwithstanding I also was call'd in on the last days, and both of us did whatever we thought most proper, he perish'd on the ninth day of the disease.

The other labouring under a very similar disorder; if you consider'd the erosion of the skin, and the crusts with which the arms were first affected, soon after the legs also, and finally some other parts; and having, by the advice of I know not whom, made use of a shirt medicated with the fumes of sulphur, got rid of almost all the disorder of his skin indeed, but was, at the same time, seiz'd with rheumatic pains of the whole body, join'd with a

(*l*) Aët. N. C. Tom. 1. Obs. 231.

(*m*) Eph. eorund. Dec. 3. A. 9. & 10. Obs.

113.

(*n*) Epist. 50. n. 13.

(*o*) Eph. cit. Dec. 3. A. 2. Obs. 167.

(*p*) Ejusd. Dec. A. 9. & 10. Obs. cit. 113. & Obs. 16.

(*q*) Append. ad Dec. 3. A. 5. & 6. n. 8. in Obs. Parallel. ad Obs. 58.

(*r*) Dec. 1. A. 1. Obs. 53.

(*s*) n. 7.

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fever; which not only prevented him from sleeping in the night, but also, in the day time, render'd him incapable of turning himself from one side to another: and indeed began to affect even the tongue itself, and the œsophagus.

I endeavour'd to obviate these symptoms speedily and diligently. But if nature had not assisted us, by expelling the repell'd matter, partly to the skin, and partly to the intestines, where it tended spontaneously, we should certainly never have seen these pains critically solv'd within a month; nor the skin perfectly heal'd within the next spring: nor would the patient have got safely over this disease, so as to live to an extreme old age.

Indeed there is no physician whatever, to whom cases of this kind, as I said, have not occur'd; even from the very time in which Hippocrates, first of all (*t*), took notice of that Athenian, who, being affected with a very violent prurigo of the whole body, and having such a thickness, and appearance of skin, as resembled a leprosy, made use of the warm baths that are in Melos; and “was freed from the itching, and thickness of skin, indeed, but became dropsical and died.” Martianus (*u*) suppos'd, that the waters of these baths were sulphureous: Pliny certainly has said (*x*), that “the island of Melos was very excellent sulphur:” and Dioscorides asserted, that it was “generated there in great quantity.”

4. These things, and those in particular that I have taken notice of, in regard to diseases that follow the repulsion of a scabies by unction, will, without doubt, induce you to enquire of me, what I therefore think of those very minute animalculæ; which, as very industrious men have observ'd them in our age, and have asserted to be the only cause of a scabies, they have also asserted, might be easily exterminated, by sulphureous, and other remedies, which kill these animalculæ, externally applied; and this at any time of the year whatever; and without attending to any internal methods of cure whatever; for that the cause being, by these means, remov'd, the scabies very soon, and very safely, vanish'd; without any inconvenience, not to say any disease, being the consequence.

I however, to deal ingenuously with you as usual; will first admonish you, not to ascribe more to learned men than they claim to themselves. For as to the discovery itself, nothing is more easy than to show, that these animalcules had been already known, even to much more ancient authors than they acknowledge. I do not say to those writers, who I see are objected by some one from Daniel Sennertus (*z*), where he speaks of worms of the back; and still less to those, who have formerly taken notice of the *vena Medinensis*, as it is call'd, after Velschius (*a*), which is also confirm'd by Wepfer, as you will perceive from the preceding third section of the Sepulchretum (*b*). But I say, to those who have spoken of far less, and certainly shorter, animalcules, in the same kind of words as Abinzoar in Joannes Langius (*c*).

(*t*) Epid. l. 5. n. 4. apud. Marinell.

(*u*) Annot. ad hunc Hippocr. locum.

(*x*) Nat. Hist. l. 35. c. 15.

(*y*) De Medic. Mat. l. 5. c. 83.

(*z*) Medic. Pract. l. 2. P. 2. c. 24.

(*a*) Exercit. de Vena Medin.

(*b*) ad Obs. 26. Schel. n. V.

(*c*) l. 2. Epist. Medic. 42.

For there are, says Abinzoar, "*syrones*, or *pedecelli*, call'd by the Arabians, *asfoabat*, which creep under the skin, both in the hands and the legs: they also excite pustules, full of water, under the skin, where they lie hid: which pustules being cut into, the animalcules creep out; but are so small, as scarcely to be found out by the sight, though very quick and piercing."

That the form thereof, was also not unknown to others before, by the assistance of the microscope, is not only shown by the observations of Borelli, that are taken notice of by Velschius (*d*); according to which the *syrones* "resembled tortoises in their forms;" but is particularly confirm'd by that observation, of Etmuller, upon the *syrones*, which being publish'd in the first volume (*e*) of the *Acta Eruditorum Lipsiæ*, besides that it mentions others who had seen them before, gives an idea of the animalcules themselves, both by figure and description; in such a manner, indeed, that the description, and the figure, might both of them be render'd more perfect a few years after, but could not be produc'd in public as quite new discoveries.

Many things also, which relate to the origin of the scabies, the multiplication, and the easy communication thereof by contact; and not only this, but the easy cure of it by certain remedies externally applied; and to other circumstances of this kind, might be illustrated by clear explications. But while that external cure is recommended, without paying any regard to the internal, the same thing seems to have happen'd to these learned men, that happen'd to Van Helmont (*f*), who likewise recommended the former, and disapprov'd of the latter.

For although Van Helmont acknowledg'd, besides the scabies from contact, that also which arose spontaneously (*g*); yet, as he determin'd to each the same nature, so he also fix'd the seat of their semen, or ferment, in the skin only. In which alone, these authors so much the more readily determine, that all the disorder adberes, as in this part only, those animals form their nidusses: and they assert, that if there were none of these animals in the world, there would also be no scabies; as this disorder never seizes upon any one, unless he has got these animalcules from some other place. Let us see then, what the authors of such kind of dogmata will be led to teach from each of them; and what doctrines that are partly true, and useful, in regard to the cure, and partly less true, and less safe, in that respect, will result therefrom.

5. That very prudent, and at the same time, very learned, physician, Ballonius (*b*), having lit upon the opinions of some persons, in regard to disorders of the skin, that agree with those I spoke of just now; in dependence upon reason, experience, and the doctrine of Hippocrates; suppos'd that there are three kinds of disorders of the skin, which are cautiously to be distinguish'd from each other: that some are disorders of the skin itself as it

(*d*) Exercit. cit. c. 7.

(*e*) A. 1682. M. Septembr.

(*f*) Tract. 45. inscripto Scabies & cat.

(*g*) Ibid n. 11.

(*b*) Epid. & Ephem. l. 1. Constit. Hyem. A. 1574.

were; some abscesses of the internal parts; and others, of a middle nature, betwixt both.

Nor has he omitted the signs by which we may distinguish the one from the other: nor has he doubted but, where there are disorders of the skin only, "we must then apply ourselves to the cure of that external disorder only, without teasing the internal parts by purgative medicines."

And indeed he has shown, that those "broad pustulæ" of Simon; of whom Hippocrates (i) has said, "that he found relief when they were anointed by the fire, or wash'd with warm water;" but that vomiting was of no advantage; were certainly of the same nature. And that in particular relates to the point in question, which you will read remark'd upon those words of Ballonius (k): "when any one lies with a person affected with a scabies, and the skin is infected, this disorder is really cutaneous, and the cure ought to be quite superficial."

You see then, what there is true, or useful, in that external cure alone, the internal being entirely omitted, when any person, that is quite in good health, has just before contracted a scabies from the contact of a scabious person, or from the contact of his linen, or clothes: but you see, at the same time, what there would be less true, and less useful, in that same doctrine of cure, if the scabies were not a disorder of the skin alone, but either an abscess entirely, or an abscess join'd together with a disorder of the skin.

Nor can we easily assent, when it is said, that a scabies never arises but from the contact of a scabious person, or from his animalculæ. Does it never rise from nastiness? never from improper eating and drinking? It certainly seems otherwise to most physicians; and amongst these to Sennertus, whom I have commended in the second epistle upon Samonicus, and who wrote the following lines to Samonicus (l); if he really did write them, as I have there endeavour'd to show, and explain:

Illotus sudor, vel copia inutilis escæ,
Sæpe gravi scabie correptos asperat artus.

Does it not sometimes arise from violent and long-continued disorders like a crisis? and, to omit other causes, does it not sometimes arise from handling the wool of diseas'd sheep? certainly, what happen'd formerly at Venice, and in the country thereabout, Virgil related (m), when speaking of fleeces of this kind,

—— invisos si quis tentarat amictus;
Ardentes papulæ, atque immundus olentia sudor
Membra sequebatur.

But this was not properly a scabies. I grant it, Yet it was a cutaneous infection. And why cannot a more slight infection be communicated in the same way, as this more violent, one? Indeed the celebrated Werlhof (n),

(i) Epid. l. 6. S. 2.

(k) p. 10.

(l) De Medic. Præcept. c. 6.

(m) Georg. l. 3. in fin.

(n) Disquis. de Variol. c. 4. adnot. 54. in fin.

being induc'd thereto by various observations, asserts, he should readily believe, "that the true human scabies arises; first of all, from the wool of sheep, to which a disorder, not unlike this, is every where frequent, through improper pasture;" for as we almost all of us use woollen cloaths, and wear them for a long time together, "there are perhaps few in which something from unclean sheep, or those that are imperfectly cur'd, is not mix'd: and perhaps it is for this reason chiefly, that the workmen, who are employ'd in the manufacture of woollen cloth, are so much troubled with these disorders."

And Etmuller, the son, had publish'd, at Leipzig, in the year 1731, a *Programma de scabie ejusque ortu ab impura lana* (o), in which, I suppose, he had said the same things that he sent to the *Cæsarean Academy Naturæ Curios.* (p), to be publish'd in the same year, and upon the same subject; ascribing the pustular scabies of a certain girl, to the wool wherewith she cover'd herself, by night, instead of bed-clothes; a part of which wool, had been shorn from sheep that were infected with a scabies.

In this paper he also quotes Coschwizius, who had said, that taylor's are more frequently infected with this disorder than others, by their constant handling of woollen clothes. Nor does he conceal the words of Elianus; "that whosoever shall comb the wool of a sheep torn by wolves, and make a garment of it, will excite a scabies on the skin of the wearer:" either because a sheep of that kind, which is weak, from a very violent scabies, is unable to follow the rest; or because, being driven away by the others, lest they should be infected thereby; it, by this means, easily falls a prey to wolves.

Nor are the conjectures of these celebrated men to be slighted; because, in this city, where so many men apply themselves to the woollen manufactory, it is very rare that any one, even of these persons, is found to have a scabies. For there are different pastures in different countries; different waters, and perhaps different methods in selecting and cleansing the wool; and now certainly, if in Venice any considerable infection seizes upon the skin of sheep, their wool is not only rejected; but, lest any one should impose it upon us, it was our advice to the supreme magistrate of Venice, that presides over the public safety, when, in the year 1724, I answer'd upon this question, in the name of the physicians of this celebrated college; to cover, as Virgil says (q), "their carcases, together with their wool, in the ground, and to hide them in pits, and holes of the earth."

6. But what will you say, if the very scabies of sheep were owing to animalculæ, which are transferr'd by means of the wool to men? I do not choose to enquire whether, after so many cleansings of the wool, which are added even by those who dye the cloths, these animals can possibly live; notwithstanding the human animalculæ are certainly destroy'd, when the linen is made clean by washer-women. I rather choose, on the

(o) apud Haller. in Access. ad P. 9. Meth. Stud. Med. Boerth; imo nunc ab eod. exhibit. inter Disput. ad Morbor. Hist. sub. n. CXCIH.

(p) Aët. Tom. 3. Obs. 50.
(q) loc. cit.

other hand, to ask you to answer these things, which follow from some observations of Hoffmann (r), and Junckerus (s).

The former of those authors writes, that a scabies had arisen from an unseasonable use of acidulated waters. The other tells us, "that the juice of the birch tree, drunk in a pretty large quantity;" and, in like manner, "that the hot baths of Walckenstein; and these particularly in robust and healthy bodies; are wont to bring on a scabies." I now, therefore, ask of you, whether you think that in these baths, in that juice, and in those acidulated waters, were to be found these animalcules, of which we are speaking; so as to adhere to the skin while bathing, and to get out upon the skin, after having been taken into the internal parts of the body?

And the former of these authors says again (t), "it is necessary to observe, that the scabies, which is communicated by contagion, is always more easy to be cur'd, than that which has taken its origin from the imbred depravity of the blood, and humours:" that is to say, without any suspicion of contagion. He also mentions, as a proof thereof (u), the observation of Lanzonus (x), (who was, while he liv'd, my friend), of a scabies in a soldier, which encreas'd to such a degree, on the three or four first days of the new moon, that he was oblig'd to pass those days in bed, every month, as long as the scabies continued; and it did continue for seventeen months.

And observations, in part similar to this, that have been formerly remark'd by me, I could produce, and add to those, not only that I have, more than once, seen it happen in scabious persons, that while the fever was at its height, the itching ceas'd, and return'd at the decline of the fever; but that I know it, for a certainty, to have happen'd to a nun, that as often as ever she was let blood; and it was often necessary for her to lose blood; her scabies, which had already grown very slight, always encreas'd to a surprising degree. All these phenomena therefore, and others, which I purposely pass over, being consider'd, I ask of you, to tell me candidly, whether they seem to you to be more easily explicable by supposing the scabies to arise from animalcules, than to take its origin from the blood?

Finally, I would also wish to know, if, in any person, an external cause bring on a very troublesome itching in the skin; as, for instance, the bites of gnats, or injuries from any other little animals of that kind; and this person, indulging the itching, scratches the skin again and again, so that little ulcers arise, and resemble a scabies; I would wish to know, I say, why the same person, or others, may not have an itching brought on from an internal cause, which compels him to scratch, and to lacerate the skin, just as when it is vellicated by those animalculæ?

7. But lest you should happen to suppose, that I am more averse to this hypothesis of animalculæ, than truth and justice can warrant; I will first confess, not only that the origin of a scabies is often to be acknowledg'd

(r) Medic. Rat. T. 4. P. 5. c. 5. Obs. 3.

(u) Ibid. § 21.

(s) Consp. Medic. Theor. Pract. Tab. 90. in Cautel. n. 19.

(x) Eph. N. C. Dec. 3. A. 9. & 10. Obs. 205.

(t) c. cit. Thef. Pathol. § 24.

from these animalcules; but also, that they do sometimes really exist, where you would not be very ready to suppose their existence: so easily may they lie hid, by reason of their very minute sizes, when they are transferr'd from one body to another.

Thus I remember that, when I attended an illustrious matron, in the place of my nativity, and she was, at length, recovering from a long, various, and very difficult disorder, a scabies seem'd to be added to the other crises which had preceded; and this, coming on suddenly, soon occupied almost the whole skin, but particularly the palms of the hands, so that she could not sleep by reason of the very troublesome itching.

As I saw very small vesicles in these parts, which were full of water, such as those generally are wherein these animalcules harbour; I order'd the maid-servants to open one or two of them with a small needle, in a very clear light; and if they could take out any thing, after pressing out the water, to shew it to me, as I intended to examine it by looking through very good glasses which happen'd to be at hand. You ask me the event of my researches. There was no need to examine for a long time. The animalcule was alive; and of that very form which the more modern authors had delineated.

I then took away another, and still another: they were all alive, and of the same form. As none of the women who waited upon this lady were, in the least, affected with a scabies; any physician who had liv'd before Redi and Malpighi, would not have doubted but these animalcules had taken their origin from putrefaction: on the other hand, it was not at all doubtful with me, but some one of the maid-servants had, without her own knowledge, brought one home to her mistress adhering to her clothes; and that this had brought forth others; and these still others, in a short time; in consequence of their being extremely fruitful.

Nor do I confess this only. But if you would chuse to suppose, that the same thing which happen'd to this matron, happens to all those that are affected with a scabies, and that this one cause is always the efficient cause when a scabies is produc'd; I myself, indeed, will not readily believe it, but will suffer it to be believ'd by you a little while, till I, nevertheless, shew that it is by no means safe to cure a scabies, which has arisen even in this manner, by an external cure only, and neglect the internal: unless, perhaps, in a body, as is said above, which was before in good health, and very lately infected by the contagion.

For what, I beseech you, is a scabies, from what cause soever it may have arisen, but small ulcers, which, if they were join'd in one, would very often be equal to the largest ulcer? And what physician suffers an ulcer, I do not say a very large one, but even a small one; whether spontaneously form'd; or by the application of a cautery, or any other external cause; to be shut up after it has remain'd open for a long time, without first applying a curative regimen to the constitution?

Yet why this? Why, because by these emissaries the body had been long us'd to throw out any thing of a deprav'd, or at least of a redundant humour, which it had within it. And why should we not attend to the same thing, in the small ulcers of a scabies of long standing? for as all of these are nearly the same thing with a very large ulcer, it is the less safe to cure them, without

without internal remedies, in proportion as they discharg'd the more deprav'd humour from without the body; and in proportion as they sent back into the body the more of the same kind of humour, still more deprav'd in these little ulcers themselves, both by stagnation, and by the external air.

For that excellent archiater Senac (*y*) shews, with his usual perspicuity, that pus flowing back from external ulcers into the blood, may not only be injurious, in an equal degree with that which is carried into the circulation from internal ulcers; but may be even still more destructive to the vital organs, by reason that this has a communication with the external air, which the other has not. Yet I should never suppose it to have been more injurious to the vital organs, than when it was the cause of the internal surface of the pericardium, and the external surface of the heart, and of almost all the parts which are contain'd in the heart, being render'd scabious, in a boy who had an external scabies; I say, really scabious; for the accurate author of this very rare observation, Buddeus (*z*), found, by the judgment of his eyes, both when naked and furnish'd with glasses, that the pustules, which were in these parts, were perfectly the same with those on the skin: and this not only appear'd evident to him, but to all that were then present.

Yet the external surface of the body was cover'd over with a scabies universally; what if it had been repell'd? You see, then, of how much importance it is not to drive back a disorder of this kind: and that they do not talk altogether idly, who deny that a scabies is always a disease of the skin alone, and consequently that remedies are to be applied to the skin alone; neglecting the cure of the remaining part of the body: and not only, if this be neglected; but attempted in such a manner as to disturb the motion of nature, when verging to the skin; sometimes death, and at other times various disorders, are the consequences.

Read, in the sixth volume of the *Acta Naturæ Cur.* the sixteenth observation, which is that of the celebrated Carlius. And suppose these things to be said, by me, to shew you how much prudence is requir'd in physicians, who take upon them to cure scabious persons; and how much it behoves them to apply themselves in order, and with propriety, to the cure of the several disorders, either of the primæ viæ, or of the obstructed viscera; whether these disorders arise from the quantity of humours, or from any other depravity whatever. And among these last-mention'd disorders, we must never forget that which, as long as it subsists, requires a scabies by way of a kind of chronic crisis.

You will find examples of this kind from the observation of the celebrated Carlius (*a*), whom I have commended: both in a man who; having driven away from the nape of the neck, by means of a certain liniment, a scabious efflorescence, which often recurr'd; fell into epileptic convulsions, which were remov'd by the return of that efflorescence: and in another man, and in a certain woman also, in whom an efflorescence of this kind (which had for a long time affected the hands) being dried up, he foretold that a fever

(*y*) *Traité du Cœur*, l. 4. ch. 3. n. 6.

(*z*) *Commerc. Litterar. A.* 1745. Hebd. 42.
n. 1.

(*a*) *In fine.*

was at hand; and foretold the termination of the fever, when the efflorescence return'd.

And yet it occupied only a small part of the body, and had, in neither of these two, been repell'd by any external remedy. What then? where the scabies occupies the whole circumference of the body, and not only vanishes of itself, as in a person of whom Lanzonus speaks (*b*), who had been always scabious from his birth; but is even driven back by a sulphurated ointment, or any thing else of that kind, as in him of whom Apinus (*c*) gives the relation; and in those young men spoken of by Jo. Sebast. Albrechtus (*d*)? is it to be wonder'd at, if a malignant fever, or other considerable disorders, and particularly an asthma, come on, which cannot be subdu'd, but by the return of the scabies, either spontaneously produc'd, or by the help of proper remedies?

Thus the cause of the disorders is shewn by the very cure: that is, it is shewn to have consisted in that deprav'd matter, which, as it is injurious when retain'd internally, so when it is again discharg'd from the blood, frees us from the disorder. To this question belong the observations of our Rammazzini (*e*), made upon many persons, who, having repell'd a scabies by unctions, were afterwards seiz'd with a fever, during which they discharg'd black and fuliginous urine; yet the same persons, after the scabies had been, by the help of remedies, brought back to the skin, excreted urine like that of persons in health: and when this disorder was again repell'd, or broke out again, they shew'd this reciprocal change in the urine.

For which reason, that very cautious physician, particularly following the examples of Hippocrates, and the opinion of Ballonius, which I have produc'd above, conceiv'd that the scabies is not always a disease of the skin alone, and consequently thought (*f*), that "to drive it away by topical remedies alone," always, and without distinction, "was an attempt full of danger." To Rammazzini add another very experienc'd physician; I mean Hoffman (*g*); who "places external remedies as the last in order," in a disease of this kind; and would previously "correct, by means of proper internal remedies, the viscid, acrid, and corrupted mass of blood and humours." For he was wont to find the blood, when taken away in diseases of this kind, "so viscid and condens'd into a coagulum, as it were, that it was difficult to divide it."

8. But you will say, that the urine is not always black in case of a repell'd scabies: nor do we see this kind of blood always in scabious persons; and you even object to me my own observations, that I have written to you heretofore (*b*): as if, in fact, I had observ'd the blood to be in a very good state, in persons affected with a scabies; and not to be differently affected in other persons; or, as if, though there are various kinds of scabies, there could not be various disorders of the blood, or various degrees of disorder;

(*b*) Eph. N. C. Dec. 3. A. 3. Obs. 31.

(*c*) Dec. ead. A. 5, & 6. Obs. 117.

(*d*) Commerc. Litter. A. 1742. Hebd. 5.

n. 1. M. Mart. & A. 1743. Hebd. 14. n. 1.

M. Febr.

(*e*) Constit. Epid. Urb. A. 1691. n. 32.

(*f*) Ibid. n. 28.

(*g*) C. 5. supra ad n. 6. cit. in meth. med.

§ 15. & in thes. patholog. § 19.

(*b*) Epist. 49. n. 25.

or, what I would wish you principally to attend to, as if I had undertaken to prove any thing else to you than this, that it is by no means safe to neglect methods of internal cure; and to drive away a scabies which is not recent by external remedies alone.

And certainly, as in many persons affected with a scabies, the whole of the disorder is not in the skin, as the observations, made by me and by others, testify; how could it be safe to apply a cure to the skin promiscuously, in all persons, and neglect the internal parts? a purgation of which, if not in all persons, at least in those whose natural emunctories are not equally open, was made in part by the ulcerated skin, or at least might have been made.

What can be said to these things? Why this I suppose, that physicians are not wanting, who testify, on the other hand, that what we deny to be safe, had always succeeded well with them, promiscuously, in any scabious patient whatever; and without any detriment being the consequence thereof. But as we do not call their observations in question; so we think it but just that they, in return, should not call into question our observations, and those of the great number of other physicians that I have refer'd to above (*i*).

To which you will add other observations of Hoffman (*k*), and of other physicians, who are quoted by him (*l*). By these, and others, that I designedly pass over, it is made evident, how many and how violent disorders have been the consequence of a scabies being thus repell'd: and of course, it is certain what it is most safe to determine, in regard to that method of cure which has, at one time, one event, and at another time, another.

9. But as sulphur is made use of, among other things, against a scabies, we will add some things, in particular, in respect to this remedy. This remedy is applied externally in unguents, lotions, and even in the clothes we wear; either by the fumes thereof, as I have said above (*m*), being applied thereto, or rather by medicating them with a decoction thereof, and afterwards drying them in the sun, or at the fire, which Willis (*n*) recommends as the more easy, and much more elegant method; although I am in doubt, whether it is quite "without any disagreeable smell," as he asserts.

But, internally, it is us'd in one way by the physicians, and in another way by the common-people.

And as, in regard to the external use, which is at one time to be commended, and at another disapprov'd, we have already spoken sufficiently; now hear the manner in which the common-people make use of sulphur against the scabies, and what inconveniencies and injuries sometimes happen therefrom. They take sulphur beaten into a powder, throw it into any wine but red wine, and drink it together with the wine.

And I knew a young woman, who, having taken some in this manner, soon after felt so great a disturbance in her head, that she seem'd then to herself to be almost mad; I suppose, in consequence of the irritation of the stomach being immediately propagated to the brain, in the same manner that Boerhaave (*o*) did not doubt but opium acted, even while it is as yet in the

(*i*) N. 2. 3. 7.

(*k*) § 15. *supra* ad n. 7. cit.

(*l*) In *unc. pathol. ibid.* cit. § 18.

(*m*) N. 3.

(*n*) *Pharmac. Rat. S. 3. c. 6.*

(*o*) *Prælect. ad Instit. § 857.*

stomach, and did not need that long passage through the chyliiferous ducts; for having open'd a dog, that was now almost in convulsions from the effects of opium, which he had swallow'd, he had found the opium still in the stomach. Be this as it will; that sulphur acts on the stomach itself, you will learn or suspect from one of the observations which I shall immediately add here, if not from both of them.

10. A woman, of forty years of age, who was addicted to the use of wine and tobacco, more than became a woman, and had been married, to a porter that was a robust man, but had never borne children, having drunk sulphur in wine, more than once, in order to drive away a scabies, which she had contracted, and last of all in a much larger quantity; began, soon after, to be very much disorder'd, vomited several times, and came thereupon to the hospital: being already troubled with a fever, her pulse being hard and contracted, and she complaining of a great streightness in breathing.

For this reason fresh-drawn oil of almonds was given, and blood was taken away. The day after, her respiration being still more confin'd, blood was again taken away: and it was like that of the day before, of a firm and dense crassamentum, but cover'd over with no crust. When the cause of the disease was heard, two glasses of milk were also given. But the difficulty of breathing being encreas'd, the patient being troubled with evident convulsions of the limbs, and the pulse growing more languid, she died, so as to put an end to her disorder within about four days, after the beginning thereof.

The dissection of the body was perform'd, not only with a view to find out the cause of the disorder, but also to instruct the students in anatomy; for it was almost the latter end of November, in the year 1744: and the dissection was perform'd in the hospital, thirty hours after the time of the patient's death.

The body had a good appearance; except that the skin was here and there deform'd with a small scabies. The abdomen, however, was tumid: and this not from too much fat; for as the fat was very well-condition'd, so it was in a very proper quantity: nor yet was this tumid state of the abdomen owing to the extravasation of a great quantity of water into the belly; for although a considerable quantity of this fluid was there, it nevertheless did not appear to be out of the pelvis.

But the stomach, the small intestines, and the colon, for a considerable extent; for in other places it either preserv'd its natural latitude, or was very much contracted, which we observ'd more on the left side, near to the stomach; being, themselves, distended with air, had distended the abdomen. The omentum cover'd no intestines, by reason of its being forc'd, or drawn upwards; for this part, and that upper part of the mesocolon, which supports the transverse arch of the colon, were rigid, and distinguish'd, here and there, with red spots; but particularly on the back part.

On the external surface of the stomach, the blood-vessels were pretty turgid. And the internal surface, where the fundus came very near to the antrum pylori, show'd an area of a circular form, the diameter of which was about four fingers breadths. This area was distinguish'd, from the remaining surface of the stomach, by these circumstances, that it was less smooth, and less shining, considerably more white, and furnish'd with vessels that were

black, as if from injection; whereas, in other places, a smoothness, a brightness, a less white colour, were every where seen; but scarcely any vessels; not to say that they were not render'd conspicuous in the same manner, or of a black colour: so that it was evident to every one, that, as far as this whole area extended itself, so much of the internal lamella of the stomach had been eroded.

Nor besides this, not even in the neighbouring œsophagus, or intestines, could I observe any thing which signified erosion, or inflammation. As this stomach was bigger than the stomach naturally is, so it was without any rugæ, and had its parietes very thin: and scarcely did it retain any traces of the ring of the pylorus. The latter of which appearances, if not the effect of original formation, or from some other more ancient cause, might, together with the others, be owing to the frequent distentions of this viscus, in a drunken woman; and particularly to its late distention, from included air. The other circumstances of disease that I observ'd in the belly, are briefly these. The gall-bladder was considerably shrunk, and contain'd but little bile. The kidneys were lax. The great artery was very narrow.

I then inspectèd and dissected the genital parts with accuracy, as the woman had been barren. The testes were small and contracted, even more than they are wont to be at that age. From the left was universally prominent an hydatid of the bigness of a small grape. The uterus was inclin'd to the right side, and had its fundus rather small: for which reason the thickness of the cervix,, that was greater than it ought to be, and especially at the lower part, was more worthy of remark; as that of the corona itself, with which the osculum uteri is circumscrib'd, was also: for the osculum was here small, as it is in virgins, and of a circular form.

From this orifice distill'd a humour like milk in its colour, and not more fluid than this, nor of a bad smell; yet in a quantity which was very considerable: so that the woman seem'd to have labour'd under a uterine fluor. And that the source of this discharge was higher up than the lower part of the cervix, was shewn by the dissection of this part. For there the vesicles of the cervix contain'd a mucus, which seem'd to be more fluid, and yet not milky. Above there appear'd none even upon dissection. About the middle of the length of the cervix, I found, in two places, by cutting deeply within the thickness of the parietes, an empty roundish cellule, capable of containing a small pea, and without any signs of erosion, either there or in any other place.

Upon opening the thorax, I found, very evidently, what I had before suspected, from the vertebræ of the loins beginning to be bent slightly to the left side, that the woman was gibbous; for the vertebræ of the thorax were much more bent to the right side. But if the case had been different, or if the uterus, which I said was inclin'd to the right side, had been, like the vertebræ of the loins, inclin'd to the left side; I should have added this woman to the others whom I have already spoken to you of (*p*), when writing of the inclination of the uterus. But the inclination of the spine, at the

lower part, was here very slight; and such as the ossa innominata would not easily follow, as they did in those subjects.

However, I found no water extravasated in the thorax, or pericardium, as I did in the belly. The lungs, anteriorly and laterally, were connected very closely with the pleura: they were tumid besides, and especially the left lobe, but only from the air, and a fluid that was mix'd therewith; for they were in no part hard, or more red than was natural. The ventricles of the heart contain'd a coagulated blood: and that blood was black, as it was in other places also.

Upon opening the cranium, all the parts which were within it, seem'd to be considerably more lax than they ought to have been, on the eighth day after death; for so many days had the accurate dissection of the other parts taken up. The vessels that go through the dura mater were turgid with blood; and in the plexus choroides I observ'd vesicles full of water, in great number, and not very small. Finally, all the parts that were within the cranium being taken away, those surfaces of both the petrous processes, which look one upon another, and the neighbourhood thereof, were seen to be not smooth, but unequal.

11. A porter, the husband of the woman I just now spoke of, of a tall stature, and, although of a somewhat pallid face, and a habit of body inclining to leanness, robust nevertheless; being almost of the same age with herself, and equally given to drinking, was affected with the same scabies, and made use of the same remedy as she: but I believe not in the same quantity. After her death he continu'd in pretty good health, to all appearance, for almost six months; at the end of which he was seiz'd with a fever that seem'd to be slight, but was, in effect, so fatal; that he lay in the hospital but two days before he died: and this was about the middle of May.

On the first day, the pulse and the other symptoms were not very bad; if they had not been render'd suspected by a kind of anxiety and inquietude. On that day, as is generally practis'd with most others in the beginning, a medicine was given to cleanse the stomach and bowels, with gentleness. On the day following, all those evils, which I shall relate to you, came on; so that remembering how his wife was, they gave him milk. For he vomited: he was troubled with the same streightness of respiration that his wife was formerly: he was convuls'd in his whole body: he was, moreover, violently delirious: and in his delirium cried out that his belly was on fire. And in this manner his life was finish'd, before the third day after his coming into the hospital.

On account of this shortness of the disease, it happen'd that the body was dissected before I knew of the man's being sick; which was a circumstance that was very far from being pleasing to me. Yet the body was dissected by a very attentive and intelligent pupil of mine, who is now deservedly an eminent physician at Feltri; I mean, Anthony Guilermi: and from him I receiv'd the following account.

The belly being open'd, in the omentum, and the pinguedinous appendiculæ of the intestine colon, and particularly in those that were near the spleen, as also in the adipose membrane, as it is call'd, of the left kidney,

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the fat, which was not in great quantities, was of a brown colour and somewhat livid. And as to the colon itself, it was three times more wide than usual. The stomach was contracted, of a brown colour externally, and internally inflam'd, without any erosion, to the breadth of the palm of a man's hand, where it was turn'd towards the spleen. The lower edge of the liver was livid, and of a blackish colour; yet not to a very great depth.

Upon opening the thorax, the lungs and the heart, as well as the diaphragm, which was examin'd on both surfaces, were found to be in a natural state. In the ventricles of the heart were small polypous concretions. The head was not dissected.

12. I enquir'd whether the skin had retain'd any thing of the scabies, and, in like manner, whether the man, after drinking the wine and sulphur with his wife, had taken any more. To both of which enquiries I was answer'd in the negative. This, however, was added, that the wine which both of them had made use of, was kept in a brazen vessel. On hearing of which, as I did not doubt but this very pernicious disorder was an inflammatory fever, so I saw that it might be doubted whether the scabies, which, indeed, had been repell'd, without any proper method of internal cure, had left such particles in the blood, as were, in some measure, the cause of this very great injury; and, in like manner, as the stomach was the seat of this inflammation, whether this did not happen the more easily, because it had been already somewhat weaken'd by the drinking of that wine. At least, you have read what injury the stomach of his wife receiv'd therefrom; whether this arose, in part, from the noxious quality of the brass vessel wherein it had been kept, or only from the sulphur that had been mix'd with it.

For how injurious sulphur may be, the ancient physicians had formerly known, from whom Pliny (q), took this dogma, that asses milk was useful "against gypsum, cerusse, sulphur, and quick-silver;" notwithstanding Dalechampius (r), is needlessly afraid, lest, though they had perhaps written *σπύον*, that is the *solanum manicum*, Pliny had read improperly *σείον*, that is sulphur; for it is not probable, that among those things which Pliny speaks of, as belonging to the mineral kingdom, as it is call'd, a vegetable should have been interpos'd in that passage which Pliny has copied: nor is the difference of the writing so inconsiderable, as easily to deceive the eyes of a person who copied the passage.

But even Galen has plac'd sulphur among those things (s) that "create ulcers in the parts to which they long adhere:" and Haly Abbas, whom Ardoynus (t) commends and follows, has said, that a man who drank sulphur "had a cutting, burning, excruciating pain in his stomach, and ulcers in the intestines." Yet I would not have you believe, that I attribute this destructive power to every kind, to every preparation, to every mixture, and to every dose of sulphur: for I am by no means ignorant that sulphur has been commonly given against the scabies, not only by the modern physicians, but sometimes also by the ancient physicians.

(q) Nat. Hist. l. 28. c. 9.

(r) In Adnct. ad eum locum.

(s) De compos. medic. l. 6. c. 2:

(t) De Venen. l. 2. c. 15.

But it is certain that the woman, of whom we speak, had taken it in wine which had been preserv'd in a brazen vessel, and in too great a quantity : but whether she took it in a pure, or an impure state, is by no means certain.

I would have you examine those authors who have admonish'd us what may be mix'd with it in the very mines from whence it is dug ; or, at least, what Waltherus (u) has briefly hinted, when he says, that " we must examine " whether the mines, which supply the *sulphur vivum*, do not produce, together with the sulphur, minerals that are in other respects hurtful : and " that we ought to be particularly afraid of arsenic being join'd with many " species of sulphur : for thus he had known, that, from a scruple of crude " sulphur being taken into the stomach, a vomiting, tormina, and tenesmus " had been excited : and, indeed, although the sulphur had been frequently " boil'd in water, and dissolv'd over a gentle fire ; yet, in many persons, stools " had not so much been the consequence of taking it, as tormina."

And as to that with which arsenic is join'd, this certainly ought not to be applied externally to the ulcers of scabious persons, as appears from the effects of cobalt ; which as the celebrated Jo. Adr. Sproegelius (x) justly affirms " to be of the same nature with arsenic," so he relates that this metal, being sprinkl'd upon the head of a scabious girl, had brought on a very miserable death within a few hours ; and that the same thing had happen'd, not only to a scabious dog, from cobalt, but to three others, in which he had made a slight incision of the skin, and applied arsenic by sprinkling : and he adds, that even greater marks of disease were found by dissection, than if he had given them so much arsenic by way of the mouth.

However, to the case of that girl you will add a similar one in another girl, who was affected with a *phthiriasis*, or lousiness, of the head, as related by Harderus (y) ; and to the experiments, those examples which Etmuller the son (z) has produc'd from Fabricius Hildanus, Janus Antonius Sarcenus, Amatus Lusitanus, and others ; that is to say, of death, or of the most violent symptoms, being brought on from the application of an ointment, wherewith arsenic was join'd, to ulcers ; and even to the scabies itself.

And to this subject, also, probably belongs that more ancient observation of Baccius (a), of arsenic being sprinkl'd upon a phagedenic bubo ; to which insersion death succeeded, after three days, by such violent vomitings of an æruginous humour, that a suspicion arose of sublimated mercury having been privately given.

But there is no doubt of the late observations of that very experienc'd surgeon Goulard (b), being relative to this question, as they agree with others which he refers to from Morand ; observations, for instance, of acrid and eroding medicines being applied to the fungous flesh of ulcers, and

(u) Progr. de Sulph. & Mart.

(x) Experim. circa varia venena, &c. § 28. & Exp. 36.

(y) Sepulch. in Additam. ad Sect. 11. l. hujus 4. Obs. 13. Hist. 13.

(z) Eph. N. C. Cent. 3, & 4. Obs. 127. in Schol.

(a) De Venenis, &c. ubi de Venen. quæ extrinsecus, &c.

(b) Memoire sur les Maladies de l'Uretre.

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having their small particles taken into the blood, in such a manner, that the patient died with all the symptoms of poison; though in the mean while no-body suspects the true cause of his death. And if you consider all these things maturely, you will also gather from thence, how easily the particles of erosive matter, that is proper to scabious persons, may be carried from their little ulcers into the circulating fluid.

But, before I make an end of writing upon the subject of the scabies, you will, perhaps, ask, why I never made mention of the sebaceous glands of the skin, and of the matter secreted therefrom? When the question was of *Sirones* (c), I thought it superfluous to put you in mind, that a certain appearance of worms must not be confounded therewith, as was formerly done; since in this present state of anatomical knowledge, to the increase of which I have labour'd with all my little abilities, I see that it is asserted, even by tyros in medical knowledge, "that the worms which infest the skin of children, are nothing more than a deceitful appearance; and are, in fact, filaments press'd out from the sebaceous follicles of the skin, as is sufficiently and clearly determin'd."

And, indeed, I have heard that, as there is an endemic disorder in Finland, which they call *Brest*, and which makes great havock among children, consisting in very small tubercles of the whole skin, that are extenuated into a kind of worms; I have now heard, I say, that this disorder is accounted for, by learned men, from an obstruction of the sebaceous glands of the skin: perhaps, because the matter, secreted by these glands, being in a very thick and tenacious state, is, for that reason, while it comes out in a very slow manner, form'd into filaments, which not only retard the discharge of the matter that ought to be excreted in succession; but also prevent the very necessary discharge of insensible perspiration, by compelling the matter, that lies obstructed in these follicles, to press upon the neighbouring sanguiferous vessels all round.

You see then, why, in speaking of the *sirones*, I thought it unnecessary to take any farther notice of the sebaceous matter: perhaps this might have been done with more propriety in other places. For as the secretion of this oleose matter seems to be intended not only for other uses, but particularly to keep the skin soft and flexible, and to defend it against the effect of eroding bodies; it follows, that where this secretion is either prevented, or deprav'd, those disorders must easily arise which are observ'd in cutaneous infections.

Thus in the elephantiasis, as some understand this word, the skin becomes rigid and inflexible: although this happens sometimes even without an elephantiasis; as it did formerly in a woman whom Jo. Fred. Helvetius, as you have it in Stalpart (d), cur'd within the space of three weeks; and in another describ'd by Diemerbroeck (e); for another I suppose it to be, when I compare the descriptions together: and, finally, in that Neapolitan woman whose disease and cure are describ'd, as you know, by Charles Cürti (f).

(c) N. 4.

(d) Cent. Post. P. 1. Obf. 43.

(e) Anat. 1. 8. c. 1.

(f) Discuss. d'un raro morbo cutaneo.

As to what relates to erosion, however, it is natural to suppose that this happens much more easily in those in whom the scabies does not come by contagion; but arises from the eroding corpuscles, which are so redundant in the blood, that even by infecting the sebaceous matter, they not only render it unfit to defend the skin, by its unction, from the irritating salts of the sweat; but, on the contrary, render it very fit to irritate and erode.

Why then, you will say, have you not hinted at these things above? Why, in fact, I did not touch upon this subject, lest I should either seem to set more lightly by some celebrated men than I ought, or should seem to challenge them; if I either entirely neglected, or undertook to discuss, those things which they advanc'd some years before, of the sebaceous glands, and of the matter secreted therefrom.

For such a discussion, moreover, this is not a convenient place; as it would give occasion to a long discourse, that would be disagreeable to you; and still more to myself, by reason of the repetition of those things which I have said sufficiently at large above: and that would be frequently necessary. Both of which circumstances you will naturally conjecture, from the few things that I shall briefly point out. There are sebaceous glands, say they, "in the trachea, in the alimentary canal, &c." But do you read the thirteenth animadversion of the fourth of the *Adversaria*.

They could "never find" sebaceous glands scatter'd up and down, in the skin. Do you, however, examine numbers three and four, in the third of the *Epistolæ Anatomicae*.

Yet they have seen "on the skin of the face, the breast, and the arms, of some men, small black points;" and not only these little points, but have seen "an unctuous matter, resembling a round worm, press'd out therefrom:" and they therefore say, that there are, "in the skin, certain very small cavities, which are found to be larger than their orifice;" but they contend, that these things which they have seen "are not present in a sound state."

You must, therefore, look again to those passages which I have pointed out in my writings, and others: or, rather, you must examine the *alæ nasi* in most men, and in those that are found and healthy too. What then do they say these cavities are? A *sheath*, which before embrac'd the root of a hair that is now destroy'd. And here it becomes necessary for you to read number twelve of the first of the *Adversaria* (g), and the thirty-third animadversion (h) of the fourth of the *Adversaria*; for in the former passage, I first hinted a doubt against the sebaceous glands, from the receptacles of the hairs; and, in both places, I have not spar'd to mention some things that are contrary thereto, or at least that limit its extent: to which you may now add, that those cavities would not have been the largest in the *alæ nasi*; that is to say, where the hairs were the smallest.

And that *vagina*, or *sheath*, is fix'd in the fat, under the skin; for they think "that the opinion of Columbus is supported upon truth, to wit, that "all the hairs fix their roots in the fat." But neither has Columbus said

(g) Versus finem.

(h) In fine.

all, nor have I said *all*, when I first also produc'd his opinion; as you will learn from the fifth animadversion of the second of the *Adversaria*.

For I not only knew that there are hairs, whereby we cannot shew that the whole thickness of the skin is pervaded; but I even saw that Columbus himself, among the others which are fix'd in the fat, had expressly excepted those which are in the scrotum: and that to these, others ought to be added; as, for instance, those that arise from the neighbouring integuments of the penis, and those very slender ones that arise from the pinna of the external ear, and from the caruncula lachrymalis.

Do not, however, imagine, that those sheaths of the hairs, which are substituted in the place of the sebaceous glands, are fix'd down in the fat for this reason, that they may take up an oleose matter from thence. From these sheaths, indeed, a matter is said to be discharg'd which is call'd sebaceous; but at the same time it is said not to be oleaginous, because linen-rags, or lint, "plentifully moisten'd" with this matter, "resist the flames" for a very long time;" as if, truly, we denied that nothing besides this, either of the matter of sweat, or insensible perspiration, adher'd to the linen; or, as if we had denied that this was any thing but pure oil: neither of which could ever come into my mind, as I every day see with how much ease the scurfes of the skin are wash'd off with water.

We, therefore, believe it to be sufficiently "of a saponaceous nature," not only by means of somewhat being mix'd therewith externally, but also internally; and yet not "as all the humours of our body are," but in a peculiar kind of manner: and from hence it happens, that if it be examin'd with the eye, and with the hand, immediately upon its being secreted from a sound body, and the effects of it consider'd, it is clearly perceiv'd how much it differs from the other humours.

And I would also have you transfer these things to that sebaceous matter which is separated, about the eyes, from the glands of the tarsi, and the neighbouring caruncle; for this is also mix'd with the lachrymal humour, that is constantly secreted. In which glands, and caruncle, and in the neighbourhood thereof, what my labour formerly did, I might say to some others, who have shewn, in describing them two-and-twenty years ago, either that they are ignorant of the history of anatomy, or, if they know it, that they too openly dissemble. But I do not think this worth so much notice: and I already seem, to you, to have forgotten that this, as I said above, is not the proper place for discussions of such a nature.

13. Let us go on, therefore, from the scabies, that is, from the smaller v'cers, to the larger. I never remember to have seen a larger than in a rustic man, who, when shut up in a stove, suffer'd, at first, from the unskillfulness of a surgeon in applying too much heat; and, after that, by his obstinacy in neglecting the complaints of the poor man, who cried out that he was burnt: for he did not take him out before he was half burnt in the whole outside of his body.

Wherefore, although the skin only was externally ulcerated; yet the very size of the ulcer brought the man to the end of his life, by the most continual and incredible tortures: and that within the space of two or three days, in the hospital of Incurables at Bologna; where they had carried him
soon

soon after the accident. A case not far unlike this, you will read the description of by Ledelius (*i*); but a juvenile age, a very speedy cure, and not an equal ulceration in all parts of the skin, as appears from the difference of the pains, suffer'd a more happy event to the disease.

Mention is made of old ulcers, in the observations I have sent to you, even more frequently than of the scabies. And two of these (*k*), particularly, confirm what I said of the purgation which is made by the scabies (*l*). For when an ulcer, and a scabies, afflicted one person at the same time, the former began to be much more troublesome, and painful, upon the vanishing of the latter; though the scabies was not moist, but dry. And, on the other hand, upon the closing up of ulcers, which appear'd from cicatrices on the tibiae, ill-condition'd pustules had occupied almost the whole skin.

As to what has been said of the scabies, that it must not be driven away by external remedies merely, unless when it is recent and contracted by contagion; because, otherwise, the discharge of noxious humours, which us'd to be thrown out thereby, would be by this means prevented, as well as the absorption of those humours which us'd to be carried inwards therefrom; the same may be, with justice, said of other ulcers also, as appears from the remainder of our observations. For ulcers of long standing, whether spontaneously or artificially growing dry, or shut up, have had the most violent disorders follow them; particularly disorders of the brain, and sometimes of the heart: and even then, and when ulcers, although not yet shut up, had been long troublesome, you may observe almost always, that there was serum within the cranium, sometimes also within the vertebræ, or within the thorax and belly.

And, rather than repeat these observations here, I chuse to refer you to the letters, in which you may read most of them over again; that is to say, the fourth (*m*), the fifth (*n*), the twelfth (*o*), the twenty fifth (*p*), the twenty-seventh (*q*), the forty-seventh (*r*), and the fifty-second (*s*).

14. But besides these that belong to the tibiae, we have often describ'd, in our observations, other ulcers also; as, for instance, at one time, in the observations that relate to the sinusses of abscesses, and to the subjected caries; and, at another time, in those that relate to ulcerated tumours and gangrene. However, I have not leisure here to point out all the places of these observations in particular. I chuse rather to subjoin some, which are referr'd to the two above-mention'd heads, omitting the others which I see are, with less propriety, referr'd to this subject; as, for instance, when in this section of the Sepulchretum (*t*), among the ulcers, is produc'd the case of a foetus of seven months, that was without a brain: which case you may compare with those that I have taken notice of, as being thus born, from the observations of ourselves and of others; and, as I think, in a place that is much more proper (*u*) for such observations.

(*i*) Eph. N. C. Dec. 3. A. 5, & 6. Obs. 51.

(*k*) Epist. 21. n. 30. & Epist. 4. n. 35.

(*l*) Supra, n. 8.

(*m*) N. 7. 13. 30.

(*n*) N. 15.

(*o*) N. 2.

(*p*) N. 12.

(*q*) N. 8.

(*r*) N. 4. 33.

(*t*) Obs. 1. § 3.

(*u*) Epist. 12. n. 5. & seqq. & Epist. 48. n. 48. & seqq.

(*s*) N. 30.

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In the first place, therefore, as to what relates to the former of these two heads, I mean to the sinusses of abscesses, one of my cures of this kind particularly comes into my mind; and this I shall so much the more willingly relate here, as it was perform'd by means of that remedy, the peculiar efficacy of which against even minute ulcers; that is, against the scabies spoken of above; I see is now call'd in question by some persons: and in particular by a physician, in other respects very experienc'd.

Lodovico Albertini, arch-deacon of the church of Forli, an equally noble and pious old man, began, in the spring of the year 1711, to be troubled with a kind of *dysuria*; and while they endeavour'd to mitigate this disorder, by emollient and demulcent remedies; the left leg was first seiz'd with a pain, and after that with an abscess. As from this abscess, after being open'd, pus continued to flow for a very long time, in such a quantity, every day, as might very easily carry off a man who was within one year of fourscore; the physician thought proper, in order to prevent the progress of this disorder, to give the decoction of woods, as it is call'd; and the surgeon, to apply such things to the abscess, as should tend to heal it up.

And now the very orifice of this abscess seem'd to be shut up; when, on a sudden, a violent fever came on, which greatly affected the head, and began to bring on a delirium. Then blood was taken from the other foot, and the abscess was again open'd: and by this means, the fever was indeed put to flight; but from the abscess, so great a quantity of pus was again discharg'd, and continued to be discharg'd, that they despair'd of the patient's life; and not without reason. For I, being then call'd in, for the first time, saw that the patient, who had been before of a good habit of body, and robust, considering his age, was now nothing more than skin and bone, and very weak and languid: being never free from fever, and having every now-and-then the most excruciating pains in his leg, which discharg'd every day, from its abscess, such a quantity of pus, as I could not easily have believ'd.

It appear'd to every one, that the patient could not possibly recover, unless his leg was healed. But how difficult it was to bring this about, all the hitherto useless endeavours of the physicians, as well as the care and pains of the surgeon, demonstrated: and to these things was added, the advanc'd age of the patient, the very hot season of the year; for the middle of summer had in the mean while come on; and, what was worse than all the other circumstances, a stomach quite tired out with remedies.

Two remedies, nevertheless, still remained untried: the first of which, I mean broth made from the land-tortoise, his senior physician recommended; and the last, that is the *pulvis viperinus*, another old physician, whom they had sent for from another place some days before, had propos'd, when he quitted the patient. My opinion being ask'd in regard to both these remedies, I did not disapprove the first, if the stomach would bear it: but that it might be the more easily borne, and might be of more use, I said that a greater part of the second should be added, yet in that particular manner which I was about to mention; and that our chief confidence must be placed in this.

I meant by this to say, that what remains in the *pulvis viperinus* does not seem to be of so much advantage as the fresh viper itself, if a quantity of the flesh of this animal were boil'd in thin veal broth, with an equal quantity of the flesh of the tortoise; and the same flesh of the viper that had been boil'd, were beaten up with old *saccharum rosatum*, as it is call'd, and were eaten every day in the morning, drinking after it the broth, of which I have been speaking: and to these I said might be added, betwixt dinner and supper, an emulsion, as it is call'd, of fresh almonds; adding a little sugar, wherewith coral, finely levigated, was mix'd.

The physician was so far from being displeas'd with this proposal, that, as he was pretty far advanc'd in life, and his health impair'd, he begg'd of me, in conjunction with the patient and his relations, that I would see to the execution of the plan I had propos'd. I look'd to it therefore; and, by the blessing of the Almighty, the pains of the legs began to be diminish'd gradually, and the discharge of the pus to be lessen'd to such a degree, that on the fortieth day from the time of beginning this method, the abscess was almost tending to cicatrization.

And although the fever had now long been taken off, and the weakness and emaciated state of body had decreas'd; yet, in order to confirm, and increase these advantages, I continued, in compliance with the spontaneous entreaties of the patient, and not merely by his consent, to make use of the same method of cure ten days longer. At the end of which period the patient, who had been confin'd to his bed from the latter end of April to quite the middle of September, began to rise; and recovering his health and strength more and more every day after that, not only recover'd his former habit of body, but shew'd me that very leg, from whence so great a quantity of pus had flow'd for so long a time; and from whence so many oblong pieces of membranes had come away together with the pus; differing nothing at all, either in point of nourishment or strength, from the other, when I happen'd to meet him in the beginning of December: and he liv'd some years afterwards in very good health; till at length he was carried off, in an extreme old age, when I liv'd at Padua.

15. I was impell'd, by more than one reason, to relate this cure to you thus fully. For there are some who ascribe to vipers, properties which they have not; as, for instance, so great a power of warming and drying, as to create an inextinguishable thirst, and to dissipate those few spirits that old men have remaining: for which reason Claudinus admonish'd (*), that the use of them should be forbid to persons far advanc'd in age; and especially in the summer time, and in a warm region.

Redi (y) indeed has observ'd, that no thirst was excited in an old man, or in young men, by a much larger use of the vipers; although it was sometimes summer when the experiment was made. And as I have never observ'd any thirst, or dissipation of spirits, from the use of the vipers, even in this old man, at the most hot season of the year, and in a country that is rather warm; nay, have even observ'd a revival of the strength and spirits, and that nothing was dried, except what I wish'd to be dried up, that is, the abscess; so I

(*) Append. ad Traët. de Ingress. ad Infirm. Sect. 6.

(y) Osservaz. int. alla Vipera.

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have, on the other hand, seen the body, in general, always recruited, instead of being dried up.

Others, on the contrary, say, that no more is to be expected from vipers, than “ from the other dried parts of all animals, which are endow’d with a “ kind of gelatinous, mildly sulphureous, and vaporose juice.” You perceive that these things were written in those countries wherein there is not a plenty of fresh vipers. For which reason, I am not surpriz’d, that in these places “ various medicines, prepar’d from vipers, have done nothing in an “ atrophy, a consumption, a scabies, and other disorders of this kind;” or that it should be said, that “ no solid advantage, at least, which can make “ it worth our while to try the experiment, can be expected from these re- “ medies, in correcting the impurities of the blood.” I do not, however, here speak of dried vipers, or of remedies thus prepar’d, but of fresh vipers; for you have seen that I prefer’d the latter to the former; as it was in the case of an abscess, which to that time could not be heal’d: following the practice of an illustrious, and more ancient author, than those whom they commend, I mean Antonius Musa, who, as he liv’d in Italy, and was the physician of Augustus, “ when he happen’d to light on ulcers that had been “ incurable, gave vipers to be eaten; and by this means cur’d them with a “ surprizing celerity,” as Pliny has deliver’d down in his writings (z).

For as to their adding, that “ if any good was done by these medicines, “ it was rather to be ascrib’d to other ingredients that were mix’d therewith, “ and to medicines given in conjunction therewith;” though this might be true of their preparations thereof, yet certainly of the vipers which Musa gave to be eaten, I do not think you can suspect any such thing: as it appears, that they were eaten alone, and not mix’d with other remedies; nor yet of those that were “ prepar’d after the manner of fish,” which a miserable slave, who was cur’d by himself in this manner, had been order’d to feed upon, by that great physician among the Greeks, Craterus; from whom the very learned Mead conjectures (a) that Musa had learn’d this remedy; nor of those which, another very great physician, Aretæus (b), “ gave at supper “ by way of food, boil’d and pickled, just in the same manner as fish,” that is, “ with salt and oil,” as it is very easy to understand from Cælius Aurelianus (c). Galen also (d) ordered the viper-catcher to make use of vipers “ prepar’d in a pot, after the manner of eels.”

But it appears, you will say, that he did not cure the viper-catcher by vipers alone: for he confesses what he did before. But the same does not appear of those two physicians above-mention’d. And if taking away blood, and atrabilis by medicines, had cur’d the viper-catcher, Galen would not have given the vipers afterwards, nor have attributed his cure thereto.

And you may suppose the same thing to be said by me, if you should happen to make the same objection to the cures happily perform’d by vipers, or by parts of them; either by the Greeks, whom I have quoted; or by the Arabians, who were followers of Galen; or by the physicians who have liv’d

(z) Nat. Hist. l. 30. c. 13.

(a) De Venen. Tentam. 1.

(b) De curat. tardar. ægri tud. l. 2. c. 13.

(c) Morb. Chron. l. 4. c. 1. vers. fin.

(d) De simpl. medicam. facult. l. 11. c. 1.

in the ages nearer to our own : for these are so many in number, that it would not only take up a great deal of time to mention them here, but it would be superfluous ; as you may see them mention'd in Marcus Aurelius Severinus (e).

And though, out of these cures, there are some which you cannot readily admit, yet I do not think you will reject them all as fables, and circulatory frauds ; since the most bitter enemy thereof you can mention, Redi (f), has expressly asserted that the flesh of vipers is alexipharmac, and “ a remedy against many diseases ;” and his sagacious imitator, Vallisneri (g), has openly shown what he thought, when he affirm'd “ that our vipers about Verona “ are more efficacious in the cure of diseases, than those about Ferrara and “ Mantua, and such other moist and marshy places :” and I remember how often he recommended them in his medical opinions, and how often in conjunction with me ; and you may see how often he prescrib'd them in those works that he has publish'd. And, indeed, in those countries where you would have thought that this remedy was less known, you will find that it has been, and is still, in use.

Thus, for the sake of example, Etmuller, I mean the son, although I might quote the father (h), and the more ancient German physicians, expressly relates (i), that in the neighbouring province of Silesia, “ the decoction of vipers in chicken-broth, was almost universally made use of “ among the richer sort of people, to cure hectic, and impurities of the “ blood and lymph.”

Thus Hoffman himself (k) ; I say himself, for he was not always consistent with himself in this respect ; when he examin'd a method of cure which had been improperly begun upon an illustrious man, who labour'd under a spasmodic asthma and a dropsy, whose dissection he also gives ; does not indeed commend the improper time in which both the powder of vipers, and the viper-broth, had been given : but then he commends highly ; for “ it is “ certain from frequent experience,” says he, “ that vipers, given both in “ powder, and in decoction, possess antispasmodic virtues, attemper acrid “ humours, promote transpiration, and for that reason cleanse the mass of “ blood from all impurities.”

So Adolphus (l) speaks of a soldier, who “ was freed from a very troublesome disorder, and one that was obstinate against all medicines, by a continued use of remedies, particularly those of the viperine kind.” So, finally, not to omit those things which have been publish'd among the same Germans, while I was writing these letters, Jo. Bapt. Molinari (m), a physician whom I have before quoted, commending “ decoctions prepar'd from the vipers “ themselves,” says, “ for they are approv'd by many experiments, both “ those of learned men, and mine.”

(e) Viper. Pyth. P. 3. c. 7. & alibi.

(f) Opere Tom. 4. Lettera A N N. che comincia *La Vipera*.

(g) Opere Tom. 3. nel Saggio d'Istor. Med. alla parola *Vipera*.

(h) Schroder. dilucid. de Animal. Cl. 1. ubi de Vipera, & alibi.

(i) Eph. N. C. Cent. 7. & 8. in Append. n. ult.

(k) Consult. & Resp. Medic. Cent. 1. Caf. 93.

(l) Aët. N. C. Tom. 2. Obs. 158.

(m) Specim. de Apopl. P. 2. S. 4. n. 180.

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There is no need to speak of other polite nations, since Mead (*n*) heard from a learned physician, who had resided many years at Bengal, that in regard to the very Indians themselves, “ it was a constant custom there, for “ practitioners to prescribe the use of the viper of that country, by way of “ diet, to those who had been exhausted by a long disease.”

But these are barbarians, and therefore not so skilful. What then will you say of Mead himself, to whom you cannot well prefer any one of the most eminent physicians, either in point of science, skill, judgment, or authority? He certainly (*o*) judg'd with great propriety of the broth of vipers; their jelly, flesh, and volatile salt; found fault with nothing but the too great sparingness of the English physicians in prescribing this remedy, “ which was proper to answer the best intentions,” and the great efficacy of which he himself “ had seen in obstinate leprosy.”

Shall we say then, that he ought not to have attributed this efficacy to the vipers, but to the other remedies which were mix'd therewith? He had, however, mix'd nothing with them, having only made use of the wine, in which he had macerated two or three vipers in a moderate heat. Nor, to return at length to the patient in question, do I suppose you will readily imagine, when you have consider'd all the other things I gave him, which have been particularly made mention of to you by me, that the cure ought to be set down to the account of those, rather than of the vipers.

But if you should happen to have any doubt remaining, I have other examples of successful cures at hand, in which I gave nothing but the vipers, nor was under a necessity of giving any thing else. For though, in general, as I love to make use of the most simple medicine I can, I give only the flesh of the vipers and the broth, particularly against an obstinate scabies; which, when other remedies were of no effect, I have driven away by this means, so as to make the patients become clean, smooth, and fat; yet it sometimes happens that I have to do with those, who are not only very obstinately averse to vipers in particular, but to almost all remedies in general: and as it necessary to relieve these persons by such kinds of medicines as they themselves could not perceive and observe, I have restor'd their health to them, by the salutary fraud of boiling vipers in the broths which they made use of: and this without their suspecting the deceit.

Among these, in particular, was a noble Venetian senator, whose case was, in most of the circumstances, comparable with the case of the arch-deacon (*p*) already propos'd. For this patient also, when he was a very old man, labour'd under a long continued abscess of the leg, in the summer-season of the year 1732. And, without any other internal medicine besides that I have spoken of, I succeeded so far, that a man of this age should be able to bear so long a disease, and those continual discharges of pus; and should have his vitiated humours chang'd so much for the better; that the abscess being thus heal'd, he return'd to his former strength and plumpness in his whole body, and in that leg in particular, much sooner than could be expected: and for six years afterwards, for he liv'd thus long, he did not need the assistance of medicine.

(*n*) Tentam. 1. cit.

(*o*) Ibid.

(*p*) *n.* 14.

Will any one say, then, that the veal or chicken-broth, in which I order'd a sic'd viper to be boil'd, both for him and for other persons, was of such an efficacy, that whatever advantage follow'd therefrom, ought to be ascrib'd to this rather than to the viper? Some persons will, perhaps, rather ask me, why that which has succeeded with me; and not only with me, but with most physicians of every age, and of almost all nations; does not succeed with all? as if, except this one, all other remedies answer'd always, and with all persons.

With some persons it certainly has not answer'd; for this very reason, that it has been mix'd with other, and still other remedies. With some, because they did not give it for a sufficient time. With some, because they have been deceiv'd in the choice of the vipers, they not having been catch'd in those regions and places that they suppos'd, nor at the time of the year it was proper they should have been taken. With others, because they lit on such patients, on such a cause, violence, or inveteracy of disease, as did not leave room for any remedy; or, at least, not for this.

Add other circumstances of this kind, in as great a number as you please; so that they do not impeach the science, or the veracity, of those persons, to whom, however, it was not sufficient, in this affair, to differ from their ancestors, without endeavouring, at the same time, to convict them of the vanity of mountebanks: and I could wish this were not too much the custom at present.

16. The mention, just now made, of that noble senator, brings into my mind a circumstance relative to abscesses. Hippocrates (*q*) has taught us, that, "while pus is forming, pains, and fevers, happen more frequently than when it is already form'd." Yet he has, even himself, signified, in the fourth book of the Epidemics (*r*), of this dogma, as he has of what is contain'd in many other aphorisms also, that though it is, for the most part, true, yet not so always: and that, if not where he has said that some mature abscesses, in diseases, are borne easily, and without a fever; for this, Martianus (*s*) contends, is to be understood of those that are already suppurated; and not, as Vallesius (*t*) understands it, of those which are in a state of supuration; at least soon after, where, in the opinion of both these commentators, he says, that, in Leambios, "the shoulder, and the fundament, were ulcerated without a fever."

In the case of that senator, also, when I saw the tibia; which had been already swell'd from an œdematous tumour of some standing, and a late slight contusion, that had been follow'd by a very inconsiderable erysipelas, and a small degree of fever; become more and more tumid soon after, though neither the patient, nor I, observ'd any peculiar fever, any rigors, any sense of pain, heat, or pulsation; I, nevertheless, began to suspect, that pus was in the mean while preparing, and not without reason; as the very evident fluctuation of matter, felt under the hands soon after, confirm'd.

Does it, therefore, happen in old men, or even in limbs affected with

(*q*) S. 2. Aph. 47.

(*r*) N. 22. apud Marinell.

(*s*) Annot. ad hunc locum.

(*t*) Comm. ad eund. locum qui ipsi est n. 95.

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œdematous tumours, that pus is form'd without any marks of its being form'd, or with fewer, and more slight, symptoms? Both of these circumstances I have heard several times from experienc'd surgeons: and when I consult reason, I see that both of them may be conceiv'd; but the second still more than the first. For all old men have not very lax fibres, and sluggish and inert humours.

In the archdeacon, therefore, of whom I spoke above (*u*), pus was not form'd without pains: and in that very senator we are speaking of, it happen'd that, at the same time the former abscess was open'd, another, much less, began at the lower part of the thigh, where there was no œdematous tumour; and we observ'd the symptoms that generally are observ'd to attend the formation of pus.

Yet that pus may be sometimes generated without a fever, even in those who are robust, and at a flourishing time of life; and that in parts which were not affected with œdematous tumours; appears from the observations of others, and in particular from those of my celebrated friend and colleague Pujati (*x*), who, like Hippocrates, in the case of Leambios, saw abscesses brought on without a fever; at first, indeed, in an old woman, but afterwards in a young woman also: and lest you should say that this young woman had her humours in a very inert state, as, some months after, she died of a dropical disorder; he saw the same also in a robust man.

17. Now, then, let us also touch slightly upon some things which relate to the caries, that frequently lies conceal'd beneath abscesses and ulcers. You have, in the beginning of the fourteenth letter (*y*), observations relating to a caries of this kind. But this particularly lies conceal'd in that kind of disease, to which the Arabians have given the name of *Ventofitas Spinæ*: although there does not always appear a very evident caries, but only a tumour and softness of the bones; as in the two that Mauchart (*z*) examin'd after death.

Therefore, as it is equally proper to speak of this disease, even upon tumours as upon ulcers; I, for that reason, in the fiftieth letter (*a*), when, in treating of tumours, mention was made of certain exostoses; took some notice of caries, and its origin. But you will also find, in the Sepulchretum, in both places, some things relative to the same disease, most of which were observ'd at Padua; that is, in the second section (*b*), which, in this fourth book, is entitl'd *De Tumoribus*, and in this fourth section, which is intitl'd *De Ulceribus* (*c*).

Yet in neither place is Pandolphinus, who publish'd a treatise of the "ventosity," spoken of; nor Merclinus, who increas'd it with so many annotations and observations: nor is any thing added from Schelhammer (*d*), who treats of the disorder briefly indeed, but with learning and skill; producing observations also (*e*), some of which I do not see in the Sepulchretum,

(*u*) N. 14.

(*x*) Dec. Obs. 7. n. 3.

(*y*) N. 3. & seqq.

(*z*) Eph. N. C. Cent. 9. Obs. 33. & 34.

(*a*) N. 57. 59.

(*b*) Obs. 20. & in Addit. Obs. 10.

(*c*) Obs. 5. § 1. &c.

(*d*) De hum. corp. Tumorib. S. 2. P. 1.

n. 94. & seqq.

(*e*) N. 98, 99.

and among these even his own : which, at that time, excellently well defended Van Horne (*f*), who differ'd from Tulpius (*g*), against the answer of Merclinus(*h*), who contends(*i*) that Corn. Celsus (*k*), in the passage which Tulpius referr'd to, had meant by the word *cancer* of the bone, a disorder very similar to the *ventositas spinæ*.

And, certainly, the reading of that passage shews, that the word *cancer* is not said of bone, as Schelhammer rightly asserts; which I do not so much wonder that Tulpius and Merclinus had not seen, as that they should have seen what is not in this place; I mean, the term *cancer of the bone*. For he says, and even repeats it over and over again, that Celsus does not call this disorder simply a *cancer*, but a *cancer of the bone*; so that he does not seem to have inspected this passage of Celsus.

18. But the question here is of names: surgeons, however, are sometimes deceiv'd in the thing itself; and those, even such as are pretty far advanc'd in life, and very much experienc'd; that is, they are deceiv'd in judging of the caries, which lies open neither to the eyes nor to the probe. It is true, indeed, that it is an indication of a caries, if the matter which proceeds from an ulcer is brown, or somewhat black.

Yet if the matter discharg'd be not ting'd with such a colour, we must not immediately deny that there is a caries beneath. For if this caries occupy a small part of a bone which is not thick, and it lie under a considerable quantity of flesh, which is hollow'd out by large ulcerous sinusses; even this one simple circumstance may be the reason, why the matter discharg'd from the orifice of the ulcer is not of a brown colour; in consequence of the very little matter which flows from the bone, being mix'd and diluted with that which flows from the flesh in considerable quantity, and the brown colour thereof being hid.

And this I know, for a certainty, to have happen'd in a young Venetian matron, in the year 1736; who having had a large abscess form'd in one side of the buttock, and not having it open'd till late, had been already treated with a great number of remedies, both internal and external, for a long time together; but to no effect. The surgeons were, therefore, long deceiv'd by the colour of the pus not being brown, and thereby prevented from suspecting a caries; till at length they observ'd the probe to pass very easily through that part of the corresponding os ilium, which, about the middle of it, particularly in women, and those that are pretty young, is transparent, by reason of its thinness, and which, in this patient, was already eroded by a caries: so that the probe pass'd on quite into the cavity of the belly.

Nor do I doubt, but as the thinness of that bony part in this very worthy matron, who deserv'd a more happy lot, afforded a very easy passage for the pus into the cavity of the belly, so that in others who have wounds inflicted upon them with sharp instruments at that place, it admits the point of a sword, or any similar instrument, to injure the intestines without difficulty.

On the other hand, it frequently happens that, by examining the colour

(*f*) Microtechn. S. 2. P. 1. § 33;

(*g*) Cels. Medic. l. 4. c. 13.

(*h*) Ad Pandolphin. c. 7. Annot. 1.

(*i*) P. 1. cit. n. 100.

(*k*) De Medicina, l. 8. c. 10. Edit. Almeloven. p. 532. l. 15. & seqq.

of the probe, which they have made use of in the examination of ulcers many surgeons do not hesitate to pronounce the case bad; not attending, I suppose, to this circumstance, that it is said by Hippocrates (*l*), “those who have the probe colour’d from the pus, as if from fire, the greatest part (not all) of them die;” nor yet observing, that the question is here of empyematic patients, and not of any colour of the probe, but of that which, instead of suffering this instrument to retain its “white and silver hue, causes it to be extracted with the appearance of lead, and as if burnt by the fire, which is a proof of the great acrimony and corrosive nature of the pus,” to use the words of that very excellent interpreter Duretus (*m*).

Finally, among the other species of caries, that species would not only be worthy of peculiar mention, but very worthy of examination, under which, after having corroded the cranium, “appear’d to the eye” of Slevogtius (*n*), “by the help of glasses, a congeries of innumerable small worms, entangl’d in a viscid humour; many of which, upon being thrown into warm water, gave tokens of their being alive, by their motion.” But as the observer himself, who saw these appearances in the dead body, and might also have observ’d some things relative thereto in the living patient, has deferr’d the *ætiology of this verminous caries* to another time (*o*); you will be less surpriz’d if we do not take upon us to make any conjectures thereupon.

19. But now let us subjoin those things that belong to the second of the two heads propos’d (*p*); that is, to ulcerated tumours and gangrenes.

Besides the observations that have been already sent to you, relating to those tumours, this one remains; which was made by our Mediavia, in the latter end of September, in the year 1739.

20. A young man had an ulcerated tumour in one side of his neck. As it seem’d proper, to the surgeon, that something in this ulcer should be consum’d, by the help of that arcanum which Philip Massieri was wont to call the *pulvis corrosivus magistralis*, and he us’d to apply with great success, but at the same time with great caution; both the fever and pain of the head, which exist’d before, were so increas’d by the application, that neither in consequence of repeated losses of blood, in which a polypous crust was not wanting, nor yet by diluents, and other remedies that were given and applied, did they give way or decrease. For although the pain in the ulcer itself was diminish’d; yet in the forehead, where it was more severe, it never remitted. The patient, therefore, died delirious and convuls’d.

The tumour had not at all injur’d the subjected muscle. This was what they call *levator scapulæ*, and in that part which lies immediately under the common integuments. The jugular glands of that side were tumid and hard.

The vessels of the brain were all distended with blood: the medullary substance was distinguish’d with bloody points wherever you cut into it, and much softer also than it ought naturally to be; whereas the cortical substance was in a natural state. In the lateral ventricles was a great quantity of limpid water.

(*l*) Coac. Prænot. apud Duret. 1. 2. c. 16.
n. 48.
(*m*) Ad eum locum.

(*n*) Dissert. de Carie Cran. in Historiæ sine:
(*o*) § 26.
(*p*) N. 14.

21. Although how much danger there is in attempting to destroy, by escharotic medicines, fungous flesh, that grows up in ulcers, in the extreme parts of the body, appears in particular from the observation of that faithful writer Benevoli (*q*); yet the use of those kinds of remedies, to the same purpose, even in other places, is not without danger, where the habit is deprav'd: as, from the fever join'd with a pain in the head, in the young man in question, it appears to have been.

But let us go, from this ulcerated tumour, to that disease which is class'd among tumours, by the writers of chirurgical institutions, and is at the same time join'd with a great corruption of the parts; I mean to a gangrene: and I shall begin with some observations of Valsalva.

22. A young man, of two-and-twenty years of age; of a moderate stature and of a tolerable good habit of body, though of a pale and yellowish colour; falling from a high building, upon a very sharp stone, broke the neck of the os femoris; and, at the same time, was wounded in that part by the stone. Being receiv'd into the hospital of St. Mary de Morte, and treated there in a proper manner, he not only complain'd of a weight in his chest, join'd with a difficulty of breathing; although he spat nothing bloody, and had no contusion on the external parts of his thorax, that could come under the notice of the senses; but moreover, on the fourth day began to be delirious, and to complain of a pain in the wound, and of certain convulsive motions in that part.

On the following night, the same part was seiz'd with a very violent gangrene; which had so encreas'd, about the fourteenth hour of the next day, as to extend itself, from the boundaries of the abdomen opposite to the wound, to the whole foot. The cuticle of the femur was rais'd up in many places, just as if medicines of the blistering kind had been applied: and these vesicles were fill'd with a serous humour, which had eroded the skin in many places, by its acrimony; so that a great quantity of water was discharg'd. In this manner the patient died on the fifth day.

The body was, a few hours after death, ting'd with the greatest blackness; as if it had been affected with an universal gangrene: and it swell'd soon after to such a degree, as to seem three times thicker than it naturally is.

23. I did not think this history ought to be pass'd over; as it shows an exceedingly deprav'd disposition of the humours, and a very speedy progress of the gangrene; although Valsalva has not given the dissection: which, I suppose to have happen'd, because it was not in his power to perform it.

For it appears, that if it had been in his power, he would not have omitted it; not only from other circumstances, which I have related in his life, but particularly, from that which, if he himself had not added it here, I should not very easily have believ'd. The serum which gives rise to a gangrene is so acrid, says he, that when I tast'd it, at another time, I not only perceiv'd the greatest acrimony, but it also irritated the papillæ of the tongue almost for a whole day. See how far the desire of knowing, and making experiments, has carried some men!

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However, you have an instance of a universal gangrene in Tulpus (r); but in an old man, whose strength had been pull'd down for a long time past. You will also have one in Warren (s), but in a yellow fever, which was a species of the plague. Yet the internal cause of gangrenes does not always consist in the sole depravity of the humours. For they sometimes seize upon the legs, because the great artery is compress'd by a scirrhus tumour in the belly (t): to which cause that observation of Hildanus, which you will read in this fourth section of the Sepulchretum (u), relates; although in that; not only the aorta, but the neighbouring vena cava also, was compress'd; for this easily happens in trunks that are so near to each other.

Yet it does not follow, on the other hand, that whatever can sufficiently compress any vein, is equally sufficient to compress a neighbouring artery; so that the conjecture of the celebrated Van Swieten (x), is equally agreeable to probability, and reason, where he accounts for the tumour, and threatening gangrene, of the left foot, from the stricture of the iliac vein on that side; which vessel, and which only, was press'd upon by the extremity of the intestine colon, that was very much distended with flatus.

And the influx of blood into the limbs is prevented, or diminish'd, by such things as press upon the artery, by lying thereupon; and moreover, by still other causes: among which is the very rare case, of gangrene, in the fleshy coat of the artery itself, although the parts that lie round about are sound; as in the case publish'd at Hall, in the year 1742, entitled, "Of the amputation of a thigh, without any effusion of blood." That cause is less rare, which produces the same effect in amputation; I mean the degeneracy of the coats of the artery into a bony nature, which not only takes away their flexibility, but streightens the passage of the blood. Kulmus (y); therefore, judg'd it to be from this cause, that "those in particular who are advanc'd in age, are sometimes seiz'd with a gangrene of the foot, without any external cause having preceded." And, without doubt, it was from this cause in a noble old man, whose history you will find in the works of the illustrious Van Swieten (z).

24. Moreover, there is a certain species of gangrene, and even of sphacelus, which very rarely occurs among the natives of this country, so that it had never yet been seen by Valsalva, when he related to me, at that time a young man, from the report of others, a case of an exsiccation beginning from the great toe, and being gradually produc'd quite to the femur; so that the foot and the whole leg were dry, and without any disagreeable smell, as in a mummy: and that this had brought on death, in a certain woman, some years before.

But he saw the case afterwards, and I with him, before I left Bologna,

(r) Obs. Medic. 1. 3. c. 46.

(s) Vid. Haller in Addend. ad pag. 662. B. suar. Accession. ad Boerh. Meth. Stud. Medic.

(t) Vid. Acta Erud. Lips. A. 1693. M. Nov. in Relat. Chirurg. Barbet.

(u) Obs. 10. § 2.

(x) Comment. in Boerh. Aphor. 422. ad B.

(y) Disput. de Tend. Achill. disrupto &c. in ipso fine.

(z) Comment. cit. § 424.

in the hospital of incurables. And indeed, among his *confilia*, I have read one which was written for a monk that labour'd under a disease of this kind. This man was more than forty years of age, of a full habit, and had his fluids inclining to a scorbutic dyscrasy; besides that, he had been before subject to tetters, and the gout; and also, even then, and for a long time past, to frequent suppurations of one of his great toes, from whence that part had always retain'd a brown colour, till it began to be seiz'd with an exsiccation, which was very slowly propagated through the whole of that toe, and, afterwards, through the whole of the next toe, in like manner.

And this toe, like the great toe; which they had amputated in vain; had always remain'd wither'd, and dry, from the time it had been seiz'd with this disease; except that lately, about the extensor tendon of that toe, some signs of incipient pus had been observ'd. And although, for the most part, there seem'd to be some obscure inflammation in the metatarsus; yet this was without any traces of a stagnating humour, and attended with moderate pain. A fever also had, more than once, come on, which had its exacerbation about the evening; but without any previous horror, and without any very violent symptom to attend it.

These circumstances I was willing to describe to you accurately, that you may compare them, presently, with those examples which I have since read in authors, or have been since propos'd to me. These cases have been very frequent in some of the provinces of France, as well as in other places. And not only about the year 1710, was this dry gangrene remark'd, but also about the year 1676, as is said in the History of that Royal Academy of Sciences (a): and even in the year 1706, as you may see taken notice of, at large, by Rudolphus Jacobus Camerarius (b); and again in the year 1747, as you will find by turning over the Memoirs of the Academy (c), last spoken of.

And there the fault is always laid to the vitiated grains of rye, in consequence of being left by the poor people, in preparing their flour, together with the sound and good grain, in a time of scarcity; for none but these poor people were seiz'd with this disease: and the unsound grain was accus'd, on another occasion, by Brunnerus (d), that is to say, when the inhabitants of the Black Forest were troubled with the same disease. Yet I should not believe, that this grain could have had so much effect, without a certain disposition of body previous thereto; or, at least, at the time when males only, and not females, if you except a few little girls, were attack'd with the same kind of gangrene, in the same villages.

However, at other times it, for the most part, affected both sexes indiscriminately: and somewhat differently at different times; so that it occupied other limbs, and other parts also, but in general began in the toes: the other differences you will see, of yourself, by examining the books, and the authors, that I have nam'd. For I return to those cases, wherein the grain could not be accus'd.

(a) A. 1710. Botanique.

(b) Eph. N. C. Cent. 6. Obs. 82.

(c) A. 1748.

(d) Eph. cit. Dec. 3. A. 2. Obs. 224.

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Indeed Benivenius (*e*), where he speaks of the unhappy event of gangrenes, that begin from the toe, especially in old men, seems to hint something that relates to this subject, when he says, “that the flesh begins, by degrees, to grow black, or to become livid: and, indeed, sometimes to grow dry, and wither’d, at the same time.”

But Hildanus more certainly, and openly (*f*); in a man of seventy years of age, who had been subject to the gout; describes a gangrene which crept upwards, by degrees, from the toes, (after an uneasy sensation of cold, and a stupor) in such a manner, that the foot and leg became black, like charcoal, and cold, immoderately dry, and extenuated; but without any pain at any time: the pulse being but little chang’d, and the appetite for food scarcely diminish’d.

The same author produces an observation of Smetius (*g*), that is to say, an observation of a woman’s foot being seiz’d with a sphacelus of this kind; so that becoming wither’d, dry, and black, it resembl’d an ox’s tongue, harden’d with smoke. And to this subject belongs, in part, what Barbette (*b*) says of the scorbutic gangrene; I mean that it generally takes its beginning from the toe; that it degenerates into a dry crust; has no bad smell; and sometimes no pain.

Now attend to a case that was describ’d to me by letter, when Matthew Tornieri, who was, when living, an eminent physician at Vicenza, consulted me in the latter end of February, in the year 1720, for a noble count.

25. This nobleman, being of a slender habit, but an excellent colour, was as yet brisk, healthy, and robust, when he completed his four-score-and-fourth year; having been never seiz’d with any disorder that was worthy of remark, during the course of so long a life. About the latter end of January he was seiz’d with an unusual sense of coldness: and three days after, with so great a coldness, that he was oblig’d to go to bed; and was there, nevertheless, cold for some hours: till, by the frequent application of warm clothes, the other parts of the body, at length, grew warm; but all the toes of the left foot, and the metatarsus, remain’d very cold, felt nothing, and were but just bent by the force of the flexor muscles; the flesh of which, you know, does not lie on the toes themselves: and what was much worse, the following day, a somewhat livid colour was observ’d to be now proceeding from the great toe, into the metatarsus.

Remedies were given internally, and applied externally, to obviate this disorder. But although the lividness in the metatarsus, and the coldness, seem’d to be somewhat less; yet, about the end of February, the extremities of the toes were already cover’d with a black skin, which was, at the same time, dry, and hard like a mummy: nor were the beginnings of a future disease wanting in the metatarsus, the skin being already black, in two places, on the back of it, and even in one of those places already hard.

It was also somewhat hard at the tarsus, in one certain place, where it was

(*e*) De abditis nonnullis &c, morbor. causis

(*g*) de Gangr. & Sphacel. c. 7. in fin.

c. 71.

(*b*) Chirurg. P. 2. l. 1, c. 14.

(*f*) Cent. 4. Obs. Chir. 92

black. And the tarsus itself was, last of all, become somewhat tumid; and, if you press'd it with the finger, preserv'd the marks of the pressure, and was in pain. And indeed a small and white vesicle had rais'd itself up under the sole of the foot; which vesicle contain'd but a very small quantity of water. At the ankle was almost the same tumour as in the tarsus. The other part of the leg was rather somewhat wasted and thin.

Under these symptoms the patient preserv'd his usual alacrity, the usual strength of his pulse, and the vigour of his appetite; although the fever, which was slight indeed, continued constantly nevertheless, from the seventh day of the disease, when it had first begun; so that he ate his food very freely, especially for a man who had never been us'd to eat much; and this was allow'd him not only in considerable quantity, but of a pretty solid consistence; in order to preserve his strength.

After having read this account, and perceiv'd that no other hope remain'd, except that the patient's life might be prolong'd for a considerable time, I immediately wrote back an answer to that effect: but there is no need to tell the whole of it here. For I discours'd, pretty much at large, upon the remedies which had been made use of, and of such as might, in my opinion, be added, with that ingenuousness which is requisite, and which I have always made use of on these occasions. When I had signified what I disapprov'd, or what I was suspicious of; I expressly recommended, among other things, with Hildanus (*i*), the juice of earth-worms, prepar'd in the manner that Wierus us'd to prepare it, to be applied externally to the part yet sound, in order to prevent the progress of the exsiccation.

Yet I did not forbear to mention, that, unless the season of the year forbade exposing the patient's foot frequently to the cold air, it might also be consider'd, whether that method which had succeeded so well, for the same purpose, with that physician at the Hague, Samuel Cabliau (*k*), was not worthy of imitation in this case: for he, having order'd the foot, and leg, which was almost wholly dead with a sphacelus, to be "continually touch'd, or, as it were, painted, with a pretty large pencil, or brush, dip'd in the best spirit of turpentine;" brought about, that the leg should adhere to the part that was yet sound, and the sphacelus not proceed upwards; the sphacelated part being "torrid, and dry, and almost like an ægyptian mummy:" and by these means he preserv'd, for nearly six months together, an old woman of almost ninety-two years of age.

The other things which I had approv'd, or added, being done; the patient, if he did not live so long as this woman, at least, liv'd much longer than those who were present had shown any expectations, or hopes of. For, about the later end of May, I was again consult'd by letters, in which Tournieri related, that the patient was still full of spirits, as before; his pulse not being weak, and his natural rosy colour almost the same; that his appetite as good; he had no thirst; he discharg'd his urine in a proper quantity; which was of a colour and consistence that was natural; but that he did not

(i) l. *supra* ad n. 24. cit. c. 13.

(k) Eph. N. C. Dec. 3. A. 5. & 6. Obs. 215.

discharge the harden'd intestinal fœces, more than once in five or six days, as he us'd to do in health.

And as to the disorder itself, he said that it had made some progress within those three months, but so slowly and gradually, that about fifty days had pass'd before the toes, and the metatarsus, and the tarsus, quite to the ankle-bones, were become black, hard, and perfectly similar to a mummy.

But after that, when the black and hard skin had rais'd itself up near the ankles, an ulcer was discover'd to be under it, when taken away by the forceps: and this ulcer was, at the time of writing, of the breadth of a man's hand, of a lively red colour at its upper circumference, and not without pain at the time of dressing; but that the external ankle, and a part of the tibia, were black: at the lower circumference of the ulcer the flesh was soft and putrid, and somewhat stinking; and when this was taken away by degrees, as they attempted to do, and as it was in that place where the dryness and hardness of the tarsus ended, they should see, he said, whether there was any thing putrid beneath: or whether all the soft parts of the tarsus had been really converted into a mummy, as they seem'd to have been.

As to what related to the leg, he said that anteriorly it was in a natural state; but that the calf was somewhat tumid: that when the leg was compress'd, a drop of pus was press'd down into the ulcer; which pus was sometimes of a white colour, and sometimes ting'd with red: yet that the limb preserv'd the natural warmth and colour of its skin. That the pus of the ulcer was variegated: and that to the part of it which was putrid, such things were applied as are enemies to putrefaction; but that when it was of a lively red, the juice of earth-worms was applied, as they also found it, by experience, to be of advantage in this part.

As to what remains, he said that this slow fever never had gone off; but was sometimes even increas'd: that some nights were pass'd in a very restless manner, on account of the itching on the surface of the body, and sometimes from spasmodic motions of the sound leg: finally, although the skin was even then soft, the patient was nevertheless reduc'd to the last state of leanness.

I was displeas'd with this last circumstance in particular, as well as many others, because it very greatly diminish'd my hope of protracting life for a very long time. Yet that I might not be wanting to this noble old man, and to his very benevolent physician, both of whom ascrib'd more merit to what I had written before, than I could by any means acknowledge; when I sent my answer to the letter, I recommended such things in particular, as were suitable against the other symptoms; but particularly against the emaciated state of body.

I therefore recommended, of the two remedies which are the most powerful at that time of the year, I mean the viper and milk; to try which they should prefer: adding this also, in regard to milk, that if they thought I had propos'd any thing useful from Hildanus, in my former opinion, they should also take this from the same author (*l*); who recommends, against that very same species of disorder, not only "womens milk," but, "if this

"cannot be got, the milk of asses:" from which, if it should be borne well, there would be a natural transition to that of cows. Which of these remedies they prefer'd I do not know: this however I know, that the life of the patient could not be prolong'd to the beginning of the summer.

26. Thus you have at large, as it is of a disease not very frequent among us, what was written to me, and what I answered thereto. But whether in this species of gangrene also, there was room to propose, internally, the Peruvian bark, and externally, warm water, I should perhaps have consider'd, if the observations upon the former had been then extant; although it answered differently at different times; I mean the observations made by many very ingenious men, but particularly those so often repeated at Bologna, by the very skilful and experienc'd academics (*m*): and if the custom of the celebrated Benevoli, in regard to warm water, had been known; particularly from that observation (*n*) wherein he, by these means, overcame gangrenes, which not only produc'd a black but a hard skin also.

And as to what relates to the Peruvian bark, although I know that it is commended by the celebrated surgeon Guissard (*o*), in a dry gangrene; yet, on the other hand, I know that its efficacy has been call'd in question by another (*p*): however, as among several things which have, at different times, shewn the utility of the Peruvian bark against other gangrenes, that experiment seems principally to deserve attention, wherein every thing became better while the bark was taken, but worse while it was omitted; and finally, better again while it was again made use of: so I should believe that there is no inconsiderable weight in a similar observation, which is extant in the history of the Royal Academy of Sciences at Paris (*q*), in order to compute the same utility in a dry gangrene: for a dry gangrene, which had begun in the foot, was alternately better and worse, according to the alternate exhibition and intermission of the bark; till at length it was quite overcome by the use thereof, without any farther interruption.

Nevertheless, you see it is here to be wish'd that the experiment were often repeated, and not only in an incipient gangrene, but where it was already perfect: and you also see, to go on to external remedies, that there is no room for the method of Benevoli, when it is determin'd not to remove what is hard, but to make it still more dry and hard, that the patient may be preserv'd the longer: to which purpose such things ought to be applied, as may preserve the dead part, in the same manner that an embalm'd carcase is preserv'd.

On the other hand, we must see to it, with the utmost caution, that we do not easily descend to the use of such applications as excite a generation of pus; bearing in mind those physicians, who, hoping to separate, by suppuration, that part of the great toe which was dead, from the living, caus'd the gangrene which Boerhaave (*r*) had put a stop to, in that part, for six months, to spread quite up to the thigh in the space of three days.

(*m*) Comment. de Bonon. Sc. Acad. Tom. 2. P. 1. inter Medica.

(*n*) 16.

(*o*) Vid. apud Haller. in Access. ad Boerh. Meth. Stud. Med. P. 13. c. 4.

(*p*) Vid. Act. Erud. Lips. A. 1751. M. Jul.

(*q*) A. 1748.

(*r*) Vid. apud Swieten. in Comment. ad illius Aphor. §. 424.

And, indeed, although there was already a kindly suppuration in a very similar case, yet the celebrated Dieter. Sproegelius (s) relates that the patient could not be sav'd; and admonishes us, that, in disorders of this kind, we must not very readily trust to suppurations; nor even those that have been wish'd for, and have succeeded according to our desire. Which circumstance, of itself, might check the hopes of those who would recommend the amputation of the dead member, in gangrenes of this kind, in old persons.

But other circumstances are also to be taken into the account; as, for instance, if, as Kulmus (t) suppos'd, and as it certainly sometimes happens, the gangrene had its origin from the arteries being become bony, and consequently streighten'd, higher up: or if, in the blood, as very frequently is the case, there was an insuperable cause of gangrene, from whence it happens, for the most part, that the same disorder will attack the remaining part, either of the same limb, or of another, soon after the separation has been made; whether this has been done by means of amputation by the surgeon, as in the observations of Hildanus (u), Tulpius (x), and others, or by means of nature itself, as you may see in the examples of gangrene from the vitiated grains of rye, which we have referr'd to above (y).

These reasons therefore, besides a decrepid age, did not permit me to think of amputating the foot in the patient describ'd by me. But even if this extreme kind of remedy could have been borne by a very old man, and the same disorder had return'd to no other part soon after, yet it would have been attended with this difficulty, that the patient would perhaps have been carried off soon after by some new disease; that is, by one of these to which this extreme old age is subject.

For to use the example of one disease only, and one therefore that relates to the subject of this letter, among my auditors of long-standing is a physician who saw three old men here, and that not long since; one of whom was seiz'd with an ulcer of the calcaneum, and the others with a gangrene of that part; happily and perfectly cur'd: yet in each of them the cure was succeeded by a discharge of sandy particles in the urine; which discharge was succeeded by an inflammation of the bladder, and this inflammation by death.

Wherefore, although in the more firm and robust times of life, there is room for heroical cures, as they are call'd; for to the danger is oppos'd the hope of a long and happy life; yet in extreme old age, as there is scarcely any hope to be oppos'd to the very great danger, and men far advanc'd in life, though cur'd by a safe and mild method, nevertheless die soon after; it does not seem that we should rashly recede from this second method of cure in like cases. Farewell.

(s) Obs. Select. §. 37.

(t) Vid. supra, n. 23.

(u) Gent. 4. Obs. 92.

(x) Obs. Med. 1. 3. c. 47.

(y) n. 24.

LETTER the FIFTY-SIXTH

Treats of Fractures and Luxations of the Bones, and of other Diseases that are injurious to Motion.

1. **A**LTHOUGH the Sepulchretum divides the disorders, at present to be treated of, into the two next sections, that is, the fifth and sixth; yet these are so short, that the observations and scholia of both of the sections are contain'd in two leaves: nor would they fill up this space, if some things that had been already said were not repeated: and this you will find to be done in the very beginning of the fifth section, if you compare the first article of the first observation, and the two first heads of the scholium subjoin'd thereto, with the third article of the fifteenth observation in the second section, and with the scholium that is tack'd to this article. It is my pleasure, however, as I am determin'd not to repeat over again what has been said already of fractur'd bones, when treating of wounds and blows, to comprize every thing that remains in the papers of Valsalva, or in mine, in relation to the disorders in question, in this one letter; beginning with that bone upon which our observations have been chiefly exercis'd, as we enquir'd whether it was broken or luxated. Which circumstance obliges us to speak promiscuously, and not separately, of both kinds of disease.

2. The ancients did not doubt but the head of the femur might, like the heads of other bones, be dislodg'd from its situation; and this so much the less, because, although they knew that the replacing of it, when fallen out, was difficult, and the preserving of it in its place still more so, yet they were not ignorant, from the testimony of Hippocrates, Diocles, Philotimus, Nileus, and Heraclides Tarentinus, that both of them had, sometimes, been exceedingly well brought about.

For these "very celebrated authors have transmitted down in their writings," as Celsus (*a*) says, "that they had wholly restor'd them;" and this Heraclides, indeed, more than once; as appears from that passage of his which is preserv'd to us by Galen (*b*), who has affirm'd that he himself, also, "had already cur'd a luxation of the femur twice, in such a manner, "that it did not fall out for the time to come:" and the same author has

(a) De Medic. 1. 8. c. 20.

(b) In Hippocr. de Artic. Comment. 1. 4. n. 42.

affirm'd, that, after Heraclides, " many other more modern practitioners" had done the same.

But as to what had been remark'd by Heraclides and Galen, that this attempt succeeded when the ligamentum teres, as it is call'd, is relax'd, and not ruptur'd; that is, the ligament whereby the femur is join'd with the acetabulum, and for this reason; because by medicines it may be brought about, that, the laxating humour being consum'd, the relax'd ligament may again be contracted, but not that the ruptur'd ligament may again coalesce: though physicians are, in part, taught the truth thereby, yet they are, in part, drawn away still more and more from the knowledge of the truth.

For it is true that, when this ligament is relax'd, the head of the femur falls out of the acetabulum; but it is not equally true, that the same head often falls out of its acetabulum, because that ligament is ruptur'd. Therefore, although the luxation of the femur from an internal cause, that is, one whereby the ligament may be relax'd, cannot be denied; yet the luxation of this bone from an external cause, that is to say, from a violence which ruptures the ligament, ought not so easily to have been plac'd amongst the most frequent luxations.

Nor would it have been plac'd there, if the difficulty, on the one hand, in breaking through a very strong ligament, and, on the other hand, the difficulty in pulling away the head of the thigh from its cervix, or in breaking the cervix, had been compar'd one with another. For it would have been perceiv'd, that the force, whereby this ligament can be broken, could much sooner pull away this head from its cervix, or break the cervix; and that, by these means, unless some bodies (c) have any thing peculiar in this part, the femur would fall out of its situation, by reason of the head being pull'd away, or by reason of the fracture in the cervix, and not in consequence of a luxation.

But these things, and others of a similar nature, did but just begin to be taken notice of at length, when dissection perform'd on dead bodies very evidently shew'd, that what was suppos'd to be a luxation of the head of the femur, from an external cause, was, in fact, almost always either a separation of the head, or a fracture of the neck.

Nor was it immediately consider'd what were the causes of this circumstance, from the time in which Parey ingenuously confess'd (d), that it had sometimes happen'd to cautious surgeons, that they had taken the separation of the head of the femur; and even to himself, in the case of a matron, that he had taken the fracture of the neck; for a luxation. But Parey had been deceiv'd by the great trochanter of the femur, which he, touching above the ischion, had suppos'd to be the head of the bone; till on the day after, while he was again endeavouring to force the bone into the acetabulum, he was warn'd of a fracture, by hearing the collision of the broken bones against each other: and was the first of all, as far as I know, who discover'd this fallacy in the thigh-bone; which is the more considerable, as, by reason of the commonness and similitude of the signs, it happens the more easily.

(c) Vid. infra, n° 5. in fine.

(d) Oper. l. 14. c. 21.

For our Columbus (e) had, in general, hinted at it, (but in children only) when, after having taught, that "if we boil the bones of a kid, or a lamb, or any other animal, lately born, we shall see certain parts in their extremities," that is, the appendices, or epiphyses, "to be pull'd away and fall off;" he then, after many things being interpos'd, admonish'd us, that if "the tender bones of children are very roughly handl'd by an unskilful physician, the ligaments are extended so far as to pull off the appendages with them."

And you will readily perceive that divulsion, and fracture, as far as relates to the present discourse, come to the same thing; and may, for that reason, be promiscuously consider'd by me; when you observe that whether the head of the femur be pull'd away from the cervix, or the cervix from the femur, these things can certainly not happen in adult bodies without a fracture: no more than if the very cervix itself be broken in the middle.

Nor yet will you think it of any very great importance, not to separate a divulsion from a fracture, if you attend to the effect and the signs of the case; unless you suppose that the sign which is taken from the sound of the bones, when mov'd upon one another, is more evident in the latter, and less evident in the former: although in children a divulsion generally happens, and not a fracture; nor is there so much importance in that sign when it is absent, as when it is present.

For the extremities of the broken cervix rarely correspond with each other; nor is it always in the power of the surgeon to move one against the other, so as to make a collision: nor can the sound, which is generally slight and obscure, be always sufficiently heard: for which reason it happens sometimes that it cannot be heard till the following day, as I have said of Parey, and even that it cannot be heard till after many days, when the inflammation is at length discuss'd.

3. I have said above, that from the time wherein Parey had discover'd the case, the causes of it were not immediately enquir'd into; but that dissections, which might shew this circumstance more evidently, were waited for. And they must have been waited for much longer, if they were first perform'd by Du Verney, as some are of opinion, or by Ruyfch, as is the opinion of others; or even if they were first perform'd by Rolfinc.

But, indeed, Rolfinc (f) has hinted who had done this thirty years before himself; I mean, Caspar Hoffmann; who, having publish'd his Commentaries on the books of Galen *De Ufu Partium*, and having admonish'd (g), "that what is thought to be a luxation, sometimes happens to be a fracture, that is to say, when the femur is broken even in the upper part of it, where the appendix is, or in the neck itself," says, "The former Columbus admonishes of all appendages, book the first, chapter the second; the latter I have seen in the thigh of a cat:" and he has subjoin'd his observation of the cat, which was suppos'd to have suffer'd a luxation of the femur, from the time that he had been continually lame, in consequence of having suffer'd some external violence when he was very young, and in which,

(e) De Re Anat. l. 1. c. 2.

(f) Dissert. Anat. l. 2. c. 49.

(g) Vid. l. 3. in fin.

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when dissected, he nevertheless found the femur not luxated, but the neck of the femur broken ; the head of the cervix even then adhering in its acetabulum.

And he has immediately added the reasons why the humerus is easily luxated, and the thigh-bone with difficulty ; the first of which is, “ because “ the former is without this round ligament, and the latter has it :” the second is, because the acetabulum of the latter is more confin’d and deeper : and the third, because the joint of the thigh is supplied, and girt around, with firmer muscles. All which reasons are commonly advanc’d at present : although Rolsinc has describ’d the observation of Hoffman, and has omitted them : and this you will find even from the Sepulchretum (*b*), which gives you every thing that Rolsinc has upon this head ; except that it, nevertheless, passes by these words, which ought to be interpos’d betwixt the scholium and the observation of Hoffman : “ Many times we have here observ’d a great “ mistake, and the like has been remark’d by Hoffman.”

But whether he observ’d it by dissecting dead bodies, or by handling living bodies, as is said of Diemerbroeck in another part of the scholium, you yourself will determine. At least none of these authors has mention’d the remark of Parey, upon that matron, and his admonition in respect thereto. For it is quite another thing that is produc’d from I know not what chapter of Parey, by Rolsinc, who, when he inculcates that this epiphysis is easily separated in infants, and young animals, by the fault of nurseries, and from slight causes, as he proves from the boiling of bones, shews that he had rather profited from Columbus, than from Parey.

But Hoffman, in his posthumous work (*i*), has universally confirm’d what he formerly had taught from that observation of the young cat ; and determin’d it to be “ exceedingly true, that a fracture in the neck of the femur “ happen’d more frequently than a luxation of the head of the femur, particularly on account of the ligamentum teres, which is in the acetabulum “ itself :” although in the year 1641, Veslingius (*k*), in writing to him, seem’d to contract the affair in some measure, in considering, for instance, when that happens, not only the strength of the ligament, but also the fragility of the bones, “ which in some constitutions is remarkable.”

And I thought proper to write these things to you pretty much at large, of those persons who have made mention of the case in question before our time, that it might appear what is to be attributed to every one ; either in leading the way to, or in acknowledging, or in demonstrating, or in enquiring into, the causes of the circumstance itself.

From the observations of these authors, perhaps, that more ancient one of Jacobus Sylvius (*l*) does not differ ; that is to say, an observation made upon a stone-mason falling from a high place, and breaking his *crus*, or leg, “ at “ the head of the hip-bone ;” and what he meant by the word *crus* is not only manifest in other places, but there, in particular, where (*m*) describing the ligamentum teres which I have so often spoken of above, as rising from

(*b*) Sect. hac 6. Obs. 2. cum Schol.

(*i*) Apolog. pro Galeno, l. 2. c. 81.

(*k*) Epist. 25.

(*l*) Observ. post Isagog.

(*m*) Isagog. l. 1. c. 3.

the fundus of the acetabulum, he says, " it is inserted into the head of the " crus."

4. Yet I shall not here, however, point out all the observations of those who have written in our age; and what I do refer to, I shall refer to only in a cursory manner; as well because these are very generally in the hands of all persons, as because the chief of them are extant in the dissertation of Salzmann (*n*), publish'd in the year 1723, in which he has, if any other person has, inform'd us of the causes, on account of which the luxation of the femur is with difficulty distinguish'd from the fracture of its neck: and yet he has shewn, that the latter happens more easily, and consequently more frequently, than the former, from the application of external violence.

Those observations were made upon such persons as were suppos'd to have their lameness from a luxation, and not from a fracture: some belong to Ruysch, some to Cheselden, and others to Erndlius; some observations of Borstius being added, with the approbation of Rau; which first-mention'd observer, having dissected the bodies of eight persons, that had been lame in the same manner, had never found a luxation, but always a fracture of the femur in its neck, as the fore-mention'd authors had done.

But Ruysch, by whose authority, in particular, the case has begun to be confirm'd in our times, has both produc'd the causes of the circumstance (*o*), together with the observations, and in several of them has remark'd somewhat peculiar; I mean, that the fragments of the cervix, which had been formerly broken, and divided into small pieces, not only did not remain behind; but that, sometimes, in the place thereof (*p*), many hard ligaments have been found, of some considerable thickness, and round in their figure; which not passing externally, but internally, connected the head of the femur with the upper part thereof: and, sometimes (*q*), that the head has been found to be conglutinated, and form'd into one substance, with this upper part of the femur.

To which two peculiar remarks there are some things that may be added. To the first, that Salzmannus, in another dissertation (*r*), publish'd five years before that which I have spoken of, had said, that those hard and thick ligaments, which Ruysch had seen betwixt the head and the femur; and which he did not doubt were substituted, by nature, in the room of a cervix; were made up of the periosteum, which being lacerated by a fracture, frequently becomes very hard and thick in that part, and is wont to put on the appearance, and perform the office, of a ligament: an example of which case had already been propos'd in the *Acta Eruditorum Lipsiensia* (*s*), in a certain fracture of the ulna and radius.

But, nevertheless, I would have you attend to this, at least, that those ligaments of Ruysch did not go to the external parietes of the fractur'd bones, as the periosteum generally does where it is, but went to their internal part. To the other peculiar remark, that is, to the observ'd conglutination of the

(*n*) De Luxat. off. femor. &c. c. 4.

(*o*) Thef. Anat. 8. n. 103.

(*p*) Thef. 9. n. 74.

(*q*) Ibid. n. 44.

(*r*) De Articul. Analog. &c. c. 2. § 1. & 4. & c. 3. § 2.

(*s*) A. 1685. M. Nov.

broken bone with its head, which at other times is wont to be found separately in the acetabulum, we must add, that when this conglutination happens; and I have known it happen more than once; it is to be attributed to those bandages, whereby the femur is kept, for a very long time, press'd very closely against the head of the bone; and to the resolution of the patient in keeping himself still, and avoiding all motion.

Yet that old woman was not free from lameness in whom Ruysch found a conglutination of this kind. For although, when the neck of the femur is deficient, the whole of the bone is less oblique outwards, and for that reason the limb less short than it would have been; yet, by these means, the femur is brought nearer the other, and the directions of the muscles that move the thigh and the leg are chang'd.

But even that woman was lame, of whom the question is in the observation of Erndlius, already refer'd to; although the fractur'd cervix itself had coalesc'd, by means of a callus of the breadth of a man's thumb, which was protuberant under the head of the bone; so that the cervix might seem not to be wanting; and no injury appear'd in the ligaments and the neighbouring tendons, nor any state of the parts that was preternatural: so easily does a lameness happen after a fracture. And in proportion as that whole part of the femur, at its superior extremity, wherewith the cervix coheres by its basis, is larger and more firm than the cervix itself, the coalition, of which I have first spoken, is less difficult than this second: the difficulty of which is increas'd by the same circumstance that renders the fracture easy; I mean, by the oblique direction of the neck.

For that impulse which the strait bones of the legs, and the thighs, often suffer without any mischief; as, for instance, in a man who falls from a considerable height upon his feet; the cervix of the femur can scarcely ever bear, by reason of its transverse direction: especially as it is very fragile, and prevented from following the motion of the femur when driven upwards, by the resistance that the head meets with, in its ascent, from the acetabulum, which is immoveable.

And these same causes, when the muscles draw the femur upwards, disjoin and unglue the parts of the broken cervix, which are again contiguous to each other, and beginning to coalesce. And the most ancient authors were not ignorant of this position of the cervix; therefore, Hippocrates (*x*) has expressly said, "that the head and neck of the femur are naturally oblique." And Aristotle (*u*), when he said that the femur was *biceps*, or double-headed, had not the same meaning, that Niphus (*x*) has given to him in his interpretation of the passage, that is to say, "that there is one femur on the right side, and another on the left;" for this he had sufficiently said already; but having in his eye, on the one hand, the large trochanter, and, on the other, the cervix in the upper part of the femur, he has asserted that the bone is double-headed.

Why it is thus divided, and has a neck running almost transversely, is far more manifest than why the neck should have so fragile a structure. For it

(*x*) L. de Articul. n. 63. apud Marinell.

(*u*) De Hist. Animal. l. 1. c. 15.

(*x*) In Expos. ejus loci.

is common to some other bones also, and is not peculiar to this only, as some learned men say, to send out certain parts which make an angle with themselves; as, for instance, the scapulæ, and the lower jaw.

But the parts sent out from these, are of a far more firm structure, if compar'd with the bones from whence they are detach'd, than the neck of the femur when compar'd therewith. Nor is this cervix so much thicker than the bone to which it is added, that we can say equally thereof, as of the extreme parts of the longer bones, that they resist breaking, by their thickness; if not by their structure.

5. But what happens in most persons in whom the cervix is broken, (for on account of the impediments, which I have mention'd, it is very rare that it does coalesce), we shall see presently, when we go on to that other dissertation of Salzmannus, and at the same time point out those observations which he could not relate in the dissertation hitherto spoken of: yet not all; for we know, that many are extant in other authors; but make mention of one or two only, which were in my hands while I was writing on this subject.

That experienc'd, and industrious surgeon, Gregory Barbett, as well as those whom we omit, saw, as you have it in his *Apologia* (y), which he, with great kindness, sent to me; the same thing in a woman, of eighty years of age, that was dissected by him; in whom, although, until the fourteenth day after she had fallen, the injur'd limb had not been shorter than the sound one, the neck of the femur was nevertheless broken: could this be, as he suspects, because it was not quite broken in the beginning; and, therefore, resisted, for so long a time, the muscles which mov'd the femur?

Yet the same author produces another observation, of a man who had been lame for a long time, from a violent kick upon the same joint of the femur. In him he found the femur luxated; so that with its head, it lay contiguous to the back of the os ilium, no traces of the ligamentum teres being left behind: the orbicular ligament being quite disfigur'd, and the acetabulum almost destroy'd.

And Salzmannus himself; who confess'd ingenuously, that neither of the cases, which he treated of with great skill, and separately, in those two separate dissertations, had as yet happen'd to be seen by him in dissection; could, five years after, affirm, that both of them had been met with by him, in the mean time, in such a manner, that in regard to the first, he asserted, "it happen'd to him to find a fracture of the femur, more frequently than a luxation:" and as to the second, that he could produce two examples of luxations of the femur, in one of which, the head of that bone, without a fracture of the neck; and in the other, the cervix (a), broken off from the head, which had been consum'd and destroy'd, "lay against the external part of the os ilium, a little above the acetabulum, and, by attrition, which had subsisted for a long time together, had form'd to itself a certain cavity, and a kind of superficial sinus, from whence both of the subjects,

(y) *Apologia di due Cure.*

(z) Vid. in *Comment. Imp. Acad. Petro-*
pol. Tom. 3. Obs. Anat.

(a) Vid. etiam *Act. N. C. Tom. 2. Obs.*

“ notwithstanding the foot on that side was shorter, could walk in some measure ; though not with facility, nor expedition.”

Nor indeed does the first of these two examples, nor the observation, which he himself had produc'd in the dissertation (*b*), from the Berlin transactions, nor any other observations of this kind, similar to these which I just now took notice of, in the second place, from Barbett, and which, as he says with justice, are “ not frequent ;” run counter to his opinion, which sufficiently appears from the very title of the dissertation itself ; “ *De luxatione ossis femoris moris rariore, frequentiore colli fractura.*”

For as more examples are extant of the latter, than of the former ; or, at least, in adults, and from an external cause ; so that Ruysch (*c*), affirm'd a luxation to happen “ rarely,” and Rau (*d*), “ very rarely ;” some contrary examples will not at all be destructive of the cautious and prudent opinion of Salzmannus ; and if there were none of these examples, his opinion, which pronounces the luxation to be “ more rare,” would of course fall to the ground.

And indeed, when he enumerates the causes (*e*), on account of which this sometimes happens ; as, for instance, the well known laxity of the ligaments from the gout ; the paralysis of the surrounding muscles and tendons ; the size of the acetabulum being naturally too large, or the head of the femur being naturally too small ; as likewise a fracture in the margin of the acetabulum ; or a defect of it ; or, in fine, tumours that had arisen within the acetabulum : it is easy for us to conceive, that where any one of these causes is not so considerable, as to be able, of itself, to thrust the head of the femur out of the acetabulum as yet ; if any external violence then happen to be applied, it will not be difficult for a luxation to follow : and the same thing may take place in those likewise, who happen to have their ligaments naturally very lax, or in whom the ligamentum teres, (which is a rare observation of Nicolaus (*f*)) is entirely deficient.

6. Now since there are some observations taken notice of, wherein it is shown what has happen'd in those persons, whose femur, when broken, or wholly prolaps'd out of its seat, could not be restor'd thereto ; we must subjoin others which relate to the same subject.

And as John Salzmannus, in that dissertation which is referr'd to above, and which is entitled, “ Of analogous articulations that succeed to the fractures of bones ;” treats of this subject in general, he has many things which you will be very willing to examine, and transfer hither ; but he produces observations, the greatest part of which, not only relate to other bones, but were made in the living body, by the judgment of the touch only, and not taken from dissected bodies, where the eye could judge also : of those therefore, which we principally enquire after here, he has none ; unless you choose to consider that of Ruysch, wherein, instead of the cervix, some thick ligaments join'd the head with the upper part of the femur, as relating to the present subject ; for those which are from Diemerbroeck, as I have observ'd above (*g*) ; do not relate to anatomical inspection.

(*b*) c. 2. § 7.

(*c*) Thef. Anat. 8. n. 103. § 2.

(*d*) Vid. Differt. Salzmann. modo cit. c. 4.

(*e*) Ibid. c. 3. § 5.

(*f*) Dec. illustr. Anat. Obs. 7.

(*g*) n. 3.

But that double observation, on one woman, which I have read in an osteological dissertation (*b*), publish'd under the auspices of the very celebrated Gaubius, and sent by him to me, with great kindness, does relate to this question. Both the thigh-bones had fallen out of the acetabulum. The head of the right femur was sound; that of the left entirely consum'd by a caries.

Therefore, as a new acetabulum was seen corresponding to each of those heads, in each of the ossa ilia; the left acetabulum was hollow'd out but slightly, the right very deeply; and the old acetabula were almost obliterated: so that it might be easily suppos'd, that these old sockets, being depriv'd of the heads of the bones, which, by their bulk, pressure, and motion, preserv'd them, had almost lost their cavity: and that those new ones were thus unequally hollow'd out, because the left head being destroy'd, before it could be press'd sufficiently close, the body was supported by the head of the bone, on the right side, which was sound; and by pressing the right os ilium, still more and more, against this head, had caus'd the os ilium to be hollow'd out thereby.

And I have observ'd, that something similar to this was seen formerly by Parey; as you will learn from a certain passage of his (*i*), which I think it worth while to copy to you here. His words are, "it happens, not uncommonly, that excrementitious humours fall with such violence upon the cavity of the hip-joint, in the case of a sciatica, that the ligaments being relax'd, they easily push the head of the femur out of its place, never to be restor'd, if it continue displac'd for some time: because a humour, which has in the mean while fallen into that cavity, concretes by delay into a kind of stony substance; and that joint of the thigh has form'd a new cavity for itself by attrition, in the neighbouring bone: and the lips of the true cavity, which are cartilaginous, have become more streighten'd, and more depress'd."

Moreover, these observations and others, if there are any, when the femur, either sound or broken, has lain upon the external part; observations, that is to say, of a new acetabulum being hollow'd out, sometimes, in the os ilium, without dissections of bodies, the successors of Hippocrates could not have been ignorant of, any more than Hippocrates himself, in that passage of his book *de articulis* (*k*); which, if I quote it according to the version generally follow'd after Cornarius, you will understand it less easily, in my opinion, than if I produce it from the version of Felicianus, join'd with the interpretation of Galen.

Thus then Hippocrates, when speaking of the head of the femur being luxated. "Yet when the joint has made some delay in the fleshy parts, whereinto it has fallen; and the flesh has contracted a lentor; it becomes free from pain in process of time. And when it becomes free from pain they can walk without a stick, if there be no other impediment: and can support the body upon the injur'd limb."

(*b*) De modo quo ossa se vicinis accommodant partib. § 42.

(*i*) Oper. l. 17. c. 22.

(*k*) n. 63. apud Marinell.

And thus it is that Galen interprets these words (*l*): "By metonymy he has made use of the word *τριβον*, or delay, from the places which, by the long continuance of travellers, are become beaten and familiar. And this is the purport of his discourse. When the head of the femur, which has been dislodg'd, from its proper seat, into the external part, is fix'd in the flesh: those who are thus affected suffer pain, in the beginning, from the compression; but afterwards, in process of time, the flesh grows callous in this part, just as the hands of labourers do. And when this is the case, the place becomes similar to an articulation; the head of the femur making use of this beaten path, or bed, as it before made use of the acetabulum of the hip."

And after having said how "a ropy and mucous kind of humour" is left there, after inflammation; "that," says he, "is very convenient for the motion of the head of the femur. For, by reason of this humidity, they make use of this path, or bed, as if it were a joint." From the comparison, therefore, of these things, you plainly perceive what those ancients conjectur'd in this affair; and, moreover, what was shown by the dissection of morbid bodies.

And all these things I have premis'd, by a long discourse in the very beginning of this letter, that I may clearly show, in a few words, to what purpose each of them tend; and which of them are confirm'd by the observations presently to be produc'd. The first of these observations is from Val-
salva.

7. A woman, of sixty years of age, who labour'd under a difficult respiration, and a cough, had her os femoris luxated by a fall. A continual fever then came on: which encreas'd the difficulty of breathing, and carried off the woman on the eleventh day.

The belly being laid open, the liver was found to be hard: and in the gall-bladder were many calculi.

On opening the thorax, the lungs appear'd to be variegated with large black spots; both internally and externally. On the right side was about a pint of water; on the left side of the thorax was a little only. The right auricle of the heart was dilated, and fill'd with a polypous concretion: and in the left ventricle was another, which was produc'd, from thence, into the vessels.

At length, as to what relates to the femur itself, it was found to be really luxated; in consequence of that ligament being relax'd, whereby the head of the femur is connected to the acetabulum of the os innominatum.

8. Those symptoms which had preceded the luxation, the difficult respiration, and the cough, may be accounted for from the dilatation of the auricle, from the water found in the thorax, and from the hard liver. The fever, which succeeded the luxation, may be ascrib'd to the pain and irritation which the luxation brought on the neighbouring parts: and from the febrile motion of the blood, affecting the lungs, and the other viscera, may

we account for the difficulty of breathing being encreas'd, and for death.

But as to the luxation happening without a fracture of the cervix, that is to be attributed to the laxity of the ligamentum teres, as it is call'd; which was perhaps naturally less firm, and strong than usual, and therefore already dispos'd to be more relax'd from the fall, and easily to give way. Nor is this observation contrary to the opinion of Ruysch; as he has affirm'd, that this rarely happens, as I have said above (*m*); but has not, as some pretend, denied that it ever happens.

But now take these two observations of the cervix being fractur'd; the first of which was made by the pupils who practise dissection with me, and the other by myself.

9. A rustic man, having fallen down from a tree, was suppos'd to have luxated the femur. The surgeons having endeavour'd to replace this bone with the more diligence, as they thought they could, with their hands, perceive the head of the bone which had been dislodg'd; it happen'd, accidentally, that these young men, who had, more than once, heard me assert, that a fracture of the cervix happens much more easily, from external force, than the luxation of the femur; and mention in what manner the great trochanter had impos'd upon Parey himself (*n*), for the head of the femur; did not scruple to interpose their suspicions, but could not withdraw the senior surgeons from their prejudg'd opinion.

Therefore, about the end of two months, a disorder of the thorax having seiz'd upon the man; who had not as yet risen out of bed; and carried him off by a kind of suffocative catarrh, before the end of the year 1727, they were resolv'd to determine their doubts by dissection, and see whether they or the surgeons were deceiv'd.

The upper part of the os femoris being laid bare, and the acetabulum into which it is inserted, they clearly show'd to all the students of anatomy and surgery who were present, that the cervix was broken through in the middle; one half of it adhering to the head, which remain'd firmly fix'd in its acetabulum, and the other to the os femoris, near to the trochanter; which, in the man's life-time, had been taken by the surgeons for the head of the femur.

But how many, and what kind of calculi, were found by them in the gall-bladder of this man (who was not icteric) and brought to me; and what experiments I made thereupon; I shall not repeat in this place, as I have written to Schroeckius upon the subject; and he has publish'd the letter (*o*).

10. A woman, about forty years of age, of a fat habit of body, and lame on the left side, had lately receiv'd a violent contusion upon the lower ribs; and being seiz'd with a fever, was carried off thereby within fifteen days, in the year 1742: at which time, as I was teaching anatomy in the college, the carcase was carried thither from the hospital. Where I observ'd nothing peculiar in regard to that contusion.

(*m*) n. 5.

(*n*). *supra*, n. 2.

(*o*) A&A. N. C. Tom. 2. Obs. 167.

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But I made other remarks there, and in particular such as relate to the cause of lameness. And these, after relating some appearances observ'd in the thorax, and belly, I will accurately describe to you, as I then demonstrated them to the great number of auditors who were present.

The right auricle of the heart, and the inferior vena cava, contain'd polypous concretions, not without a great quantity of white substance : and concretions of the same kind were contain'd in both the ventricles ; that in the left being much the largest. From the curvature of the aorta arose not three, but four arteries ; for the left vertebræ did not arise from the subclavian, but betwixt that and the carotid of the same side.

In the belly the genital parts, the kidneys, and the sanguiferous vessels, offered these things which were worthy of remark. The surface of one of the testes was very unequal. The osculum uteri was surrounded with no corona ; so that there was not any protuberance within the vagina. And the kidneys, in proportion to the middle-siz'd stature of the woman, were both of them longer than they generally are : the left was somewhat hollow'd out, by a cicatrix, on its external surface, and at the lower extremity ; and the circumference of this cicatrix approach'd, in some measure, to the figure of a circle ; the diameter of it being equal to a finger's breadth ; and the whole cicatrix being, as I suppos'd, the remains of an hydatid, which had been formerly partly buried in the substance of the kidney, and partly prominent therefrom.

The trunk of the large artery was thinner than usual, and did not send forth the spermatic artery ; but this came out from the emulgent ; nor did it give out the lumbar arteries in the usual manner ; nor was the left iliac of an equal length with the right, but a third part shorter.

And I beg of you to attend to this circumstance, as we now go on to those things which related both to the causes and to the effects of lameness. For on the left side the woman had been lame, as I said ; that limb was four inches shorter than the other, and had the calcaneum turn'd towards the outside ; yet was not less fat than the right, but even still thicker, though this was owing to an œdematous tumour.

The iliac vein therefore, on the right side, was wider than it naturally is ; but the left, and its branches, were so thin, slender, and pale, that being surpriz'd at an appearance which I never saw before, I open'd the trunk of the vena cava at its lower part. Which being done I was still more surpriz'd. For instead of the orifice of that iliac vein I found a line which was a mark of its coalition ; in which line were two or three small orifices communicating with the iliac vein.

Having cut into this vein in a longitudinal direction, and having seen, besides filaments of a polypous nature, a kind of fasciculus of fibres protuberating internally ; I soon after easily observ'd that the parietes of the vein had coalesced with each other on one side ; and by these means represented that fasciculus, the appearance of which entirely vanish'd by drawing the parietes asunder with both hands : nor was the separation difficult.

But then laying bare the crural arteries and veins, from the belly quite to the ham, in both limbs, no difference appear'd in the arteries ; yet the vein which was associat'd with the left artery, appear'd to be at least a third part narrower

narrower than that of the right side : and although it had not parietes which were folded together, and beginning to coalesce, yet it had, betwixt its coats, a kind of black blood as it were, and perhaps a real blood ; but such as to all appearance seem'd to have been concreted a long time before.

Having examin'd these things sufficiently, I enquir'd into the cause of the lameness, by laying bare the articulation of the os femoris with the os innominatum : and the os femoris was found to be depriv'd of its neck and head. As to the head of it, this remain'd fix'd in its acetabulum, though the cartilage, wherewith both of these parts were incrusted, was corroded here and there : and indeed the bony substance of the head of the femur, both where it was turn'd to the left parietes of the acetabulum, and where it had formerly coher'd with the cervix, was not quite sound and entire.

And as to the cervix, no traces of it remain'd, if you excepted some bony fragments, adhering to very thick ligaments, into which the capsular ligament seem'd to have been chang'd ; at least these ligaments were produc'd from the margin of the acetabulum to that part of the superior extremity of the femur, from whence the cervix formerly began, and connected the femur to that margin. And in the cavity which lay betwixt them, in the place of the cervix, was a thickish matter of a fleshy colour, but brown and dirty ; yet not foetid, nor in great quantity.

Besides these appearances, the os innominatum, on the left side, was more prominent forwards than the right ; so that it was natural to suspect that the same external violence, which had broken the cervix of the os femoris in this woman, when she was an infant, or when she was very young, had likewise luxated the os innominatum.

11. If you compare these two observations with each other, you will easily come into this opinion, that Ruysch's (*p*) finding no remains of the fractur'd cervix, is to be attributed to the length of time, and to the frequently-repeated agitations and frictions of the fragile extremities of the broken cervix one against another : and besides these to the eroding power of the acrid particles, distilling from the injur'd and vellicated membranes, and bringing on a caries by stagnation.

But as to what I have taken notice of, in regard to the periosteum being lacerated by a fracture (*q*), I mean that it frequently becomes harder and thicker than natural ; you perceive, from the second observation, that the same thing happens to ligaments. And as to what is said, in the same observation, of the extenuation of the iliac veins that corresponded to the injur'd limb, I would have you compare it with the dissection of another lame woman that I have already describ'd to you (*r*).

For you will find that the iliac vessels, going to the lame limb, were thinner than usual. Yet you will not only find it extenuated to such a degree through the thigh, but will not find it contracted in the belly by the coalition of the parietes on one side ; nor yet almost stopp'd up at the orifice by which it opens into the vena cava. For it is a very rare appearance, and not easily to be understood, the limb from which it return'd labouring under an œdematous tumour indeed, but yet being alive ; although we

(*f*) *supra*, n. 4.(*g*) *Ibid*.(*r*) *Epist.* 46. n. 17.

suppose it not to have been reduc'd to this state for a long time before.

However, the os femoris, in this woman, could not have receded far from the acetabulum, by reason of the connecting ligaments. And the man, of whom I spoke before her, having always lain in bed, had no occasion to make use of, and to stand upon, that limb. Now, therefore, give me leave to tell you what appearances I found in another woman, and in another man also, who had for a long time had the head of the os femoris luxated, and not plac'd; and had for a long time borne upon the limb.

12. A lame old woman was now very near to her eightieth year, when being seiz'd with an apoplexy, she died not long after; yet not so much from the apoplexy, as from the effect of it, which was but little attended to. For as the power of the bladder, by which it both retain'd and discharg'd the urine, was lost by paralysis; the assistant women, deceiv'd by the continual dripping, thought that as much urine was discharg'd from the bladder, as was continually flowing down into it: and the old woman herself either could not feel, or could not make known, this very great distension; so that it happen'd to her, as it has happen'd to others from the same fallacy (s), that she died very soon.

For the body being brought into the theatre, that I might begin to teach anatomy from thence, in the month of January of the year 1735, that cause of death came first into view, and perverted the order of teaching. For when the belly was open'd, the bladder appear'd to be so distended with urine, as to reach to the navel, and to occupy both the ilia; the intestines being driven upwards in such a manner, that on one side they forc'd the liver and diaphragm up very high, and on the other side push'd the spleen and the stomach towards the middle of the epigastrium.

But the viscera were all of a green colour, and had a very putrid smell; so that I order'd them all to be immediately taken out of the belly, and buried in the ground. What appearances therefore I observ'd in the thorax, the neck, and the limbs, that were preternatural, I shall add here; for having, in the mean while, got better bodies, we did not touch the head.

The pericardium was connected with the anterior surface of the great vessels, and of the heart: with the former by filaments, but with the latter by itself; and that for as great a space as two inches would have cover'd, both in length and breadth. And this circumstance made me enquire, from him who had been the physician of this apoplectic woman, whether her pulse had been, in any sense, peculiarly irregular, and, in particular, whether they had intermitted; which he immediately and expressly answer'd in the negative.

The great artery began to become rough, on its internal surface, at a small distance above the valves; as if from a prominence of fibres drawn in a longitudinal direction, and disjoin'd from each other here and there: this roughness was extended for two inches in length, and somewhat less in breadth. The thyroid gland, besides being very large, had its anterior sur-

(s) Vid. Epist. 42. n. 22. ubi & hæc historia promittitur.

face also prominent with certain globular bodies as it were, or at least in some places.

The left of the lower limbs, on which side the woman had been lame, was turn'd with the knee towards the inside, and with the heel towards the outside: it was also shorter than the right, and if you excepted the back part of the foot, in which part it seem'd to be pretty thick, was very much extenuated, and moreover deform'd with a large cicatrix, as if from a large ulcer which had occupi'd the external part of the fibula longitudinally; whereas the right limb had a very good appearance, was well nourish'd, and furnish'd with such wide veins, that I never remember to have seen wider in any lower limb whatever.

And as this was a proof of a greater quantity of blood flowing into that limb, in proportion as less flow'd into the opposite, so it made me regret having order'd the viscera and vessels of the belly to be buried; as it was now no longer possible to see how the left iliac vein appear'd near to the cava.

Finally, the superior joint of the left os femoris being laid bare, we found the head of that bone not so globular as it generally is, but become almost flat as it were, and somewhat enlarg'd; nor was it furnish'd with any round ligament by which it could be connected. It was receiv'd into an acetabulum less hollow than it naturally is, yet incrust'd with a cartilage. And there was at the anterior border of this acetabulum, another cavity much less than itself: a cavity of which kind was no where before the acetabulum of the right os femoris.

Moreover, the acetabulum of the left, although if you referr'd it to its own os ilium, that is, to the os ilium of the left side, seem'd to be neither lower, nor higher, nor more posterior than that of the right, if you compar'd this also with its own os ilium; yet it was more distant from the commissure of ossa pubis than the acetabulum of the right side. For the left os ilium was also much more distant from the same commissure than the right os ilium.

13. Those things that relate to the connexion of the heart and pericardium, join'd with no intermission of the pulse, you will refer to that place (1) where we have already treated of connexions of this kind, and their effects.

But as to what relates to the acetabulum, in which the head of the femur was receiv'd, I do not doubt but by comparing this observation of ours, with those of the celebrated men taken notice of above, you will readily acknowledge that this had been hollow'd out by the head of the bone, which had long before fallen out from its natural acetabulum; the vestiges of which were still remaining in that very near, anterior, and much less cavity.

For as to the new acetabulum being less deep than the natural acetabulum is, and the head of the femur being inclin'd from a globular to a flat figure; you very well understand, from these marks, that while one bone was press'd against the other by its weight, or forc'd by the motion of the muscles, the

(1) Epist. 23. n. 18.

(2) n. 5. & 6.

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one was mutually rubb'd by the other, and depress'd; so that by this means the acetabulum was hollow'd out, which if nature itself had prepar'd, would not only have been form'd deeper and nearer to the commissure of the pubes, but the head of the bone would have been globular, and connected by the ligamentum teres.

For as to its being incrusted with a cartilage, the cartilaginous nature perhaps had not been, as yet, chang'd into a bony nature in that part when the excavation was begun; so that it was not superinduc'd afterwards, but only preserv'd.

As to that other cavity, however, which was nearest to the commissure of the pubes, being the old acetabulum, and prepar'd by nature itself formerly, this is clear from the situation of it; nor does the smallness of it contradict the supposition: whether, as it perform'd that office in the beginning of life, it never was requir'd to be of a larger size; or whether, as we frequently see in the sockets of the teeth, upon taking away the bone which was before inserted, the bony substance around it increases, and fills up, or nearly fills up, the sinus: and this I also have seen in a lame man, whose history I promis'd to compleat in this place.

14. The wool-comber, therefore, whose mortal wound I have describ'd on a former occasion (*), was lame on the right side, as I have there said. This man being born with an equality of both lower limbs (for of one who was well known I could learn the circumstances I enquir'd after, though I have endeavour'd at it in vain in regard to others very frequently) his mother observ'd, when she was taking him out of the cradle while he was yet very young, and even in the first months of his life, that he had a pain in the right limb; whether some external accident, unknown to her, had brought it on, or some internal cause.

After this pain, that limb then became shorter; so that when the boy began to walk afterwards, it was surprizing to nobody that he should be lame. And by habit he gain'd an easy and expeditious method of walking, notwithstanding his lameness.

The disease of the joint, from whence the occasion of another disorder, though but inconsiderable, had arisen, in my opinion; that is to say, a disorder which had incurvated the spine of the thorax, somewhat to that side, while the man endeavour'd to incline the weight of his body to the left limb, which was more firm; the disease of the joint, I say, on the left side, appear'd in the following manner.

The acetabulum, which nature had prepar'd in its usual situation from the original formation, remain'd only in one half of it, and that anteriorly: and in the fundus thereof was a kind of substance of a reddish, but pale colour, so as to seem morbid; and if you touch'd it, you would suppose it to be not of a ligamentous, but, in some measure, of a glandular nature.

The other half part of the acetabulum was fill'd with a bony substance, and was, besides, cover'd over with a bone in some measure round; into which the neighbouring surface of the os innominatum had grown out. Above this old acetabulum was, on the external surface of the os ilium,

(*) Epist. 54. n. 46.

another acetabulum as it were, constructed of a white firm substance, and very similar to that whereof the ligaments are constructed; a border being moreover added, into which it was prominent, not only on the anterior, but also on the superior part; and which was of a middle nature, betwixt cartilage and ligament.

This surface of the acetabulum was smooth, if you excepted one place therein, which was lower than the other part; and was fill'd up by a reddish, and not very small, substance, that was easily known to be a mucilaginous gland. Into this acetabulum the head of the femur was receiv'd, which was furnish'd with no ligamentum teres, as usual, nor endow'd with its wonted magnitude, form, or smoothness. For where it began to ascend from the cervix, there none of these properties was wanting. But after it had proceeded thus for some little way, it was depress'd, and shew'd the bony substance depriv'd of its cartilage: yet this bony substance appear'd firm on the upper part, hard, and of a white colour; but granulated, just as we frequently see the surface of calculi of the urinary bladder to be.

15. If it seem'd surprising to you, that, in the old woman of whom I spoke just now (y), the new acetabulum did not want a cartilaginous crust; it will perhaps seem more wonderful that, in this man, it did not want a mucilaginous gland: not to mention the border, or supercilium, as it is call'd, of the same kind with that wherewith the natural acetabulum is furnish'd.

Without doubt many things are form'd whose mode and ratio of formation are very obscure. Nor does it fail to excite admiration, that the old acetabulum, in so long a time, was not more fill'd up at least, if not entirely obliterated: and it is also surprizing, that, as the bones were tender, the new acetabulum itself was not hollow'd out into the bones, but was even made up of a substance which may seem to agree more with the opinion of Hippocrates and Galen (z), than with the observations of later authors.

But it is my business to describe, with the utmost fidelity, those things that I, and all who were present, perceiv'd with our hands and our eyes; whether they are of a surprizing nature or not: and it is your business to observe, that the lost use of limbs is repair'd by nature, in more than one way: and although the method discover'd by the more modern authors may be true in other bodies, it does not therefore follow, that the method which the more ancient authors had hinted, can never happen in any.

But if you still desire other examples of analogous articulation, as it is call'd, either that you may compare them with those which are given by us, or that, at least, you may have more to join to the Sepulchretum; read over attentively the very learned dissertations of Saltzmann, and other observations of other persons, and of his also, which I have referr'd to above. And to these join those that are extant in the writings of those celebrated men Guttermann (a), Schlisingius (b), and Ludwigius (c); and if you desire to know of a new articulation, made from a luxation in the upper limb also, that of Henry Albertus Nicolaus (d).

(y) n. 12.

(z) Supra, n. 6.

(a) Act. N. C. Tom. 3 Obs. 105. in fin.

(b) Commer. Litter. A. 1741. Hebd. 1. n. 2.

(c) Prog. de Collo Femor. &c.

(d) Dec. Obs. illustr. Anat. Obs. 6.

And not to recede from the lower limb, whereof we are at present speaking; in the second and third of these authors, and in like manner in Platter (e) and others, you will find a great number of remarks relating to the fracture, or luxation, of the thigh at its upper part; and the latter of these sometimes from external force, sometimes from an erosion of the ligaments, and at other times from laxity.

From erosion, for instance, as in the case publish'd at Hall, in the year 1742 (f), and in others before propos'd by Mauchartus (g), and by Schulzius (h); and from laxity, as in the example of the celebrated Boettcherus (i), than which you will not easily find one more extraordinary; for the ligaments, of which we are speaking, were so relax'd, in consequence of a pestilential sciatica, that "they made both the feet longer to the measure of a whole span, than they had been in their natural state:" which is indeed surprizing; but another circumstance still more so; I mean that the patient was perfectly cur'd, "so that she could walk again, after that, freely, and without any inconvenience."

Finally, you will also add to the number, that luxation which is spoken of by Petit the surgeon (k); which did not happen so much from an external cause, as from an injury brought thereby upon the mucilaginous glands of the acetabulum: so that the mucilage, being secreted in greater quantity, and relaxing the ligamentum teres gradually, or breaking it, forc'd the head of the bone out of its cavity, after a long time, though not immediately.

16. Thus far you have heard of the more considerable diseases that we have met with in the upper joint of the thigh. Nor was that inconsiderable which was observ'd in a lame woman, whose history I defer to the next letter, in which the gout will be treated of (l). There are also some more slight disorders, with regard to which, as they have been seen in lame persons, we must not here fail to speak, and endeavour to lay open their nature.

17. An old woman of Tuscany was so lame, from a contusion of the coxendix, that she was oblig'd to confine herself to bed for a long time. A pain of the whole body came on; and, from her long-continued posture, a gangrene about the buttocks. Therefore gradually sinking, and becoming weak, she died about the beginning of March in the year 1744, in the hospital at Padua.

Although the body of this woman was of use, in order to take notice of, and demonstrate, to the pupils, many parts in their natural state, which are foreign to the present purpose; yet in doing of this I did not fail to remark some things which related more to the present occasion.

In the belly, the right lobe of the liver, on its upper and convex surface, and from the posterior to the anterior part, was hollow'd out into so deep a sulcus, that it would admit the finger; nor were other sulci wanting more to the right hand than this: and if these kinds of sulci were found in women

(e) Instit. Chir. in not. ad §. 1193. & 1194.

(f) De Amput. Femor. non cruenta § 18.

ad n. 6.

(g) Eph. N. C. Cent. 9. Obs. 34.

(h) Aët. N. C. Tom. 1. Obs. 235.

(i) Eorund. Aët. Tom. 7. Obs. 21.

(k) Mem. de l' Acad. R. des Sc. A. 1722.

(l) Epist. 57. n. 2.

only, there might be room for hesitation, whether they were not the effects of having worn very stiff stays, which women are wont to do while they are young.

The liver itself seem'd to be made up, both internally and externally, of very small and white corpuscles, which were intercepted by very slender interstices, of a brown or reddish colour inclining to yellow. The gibbous surface of the spleen was white, as if from a kind of thick crust; the flat surface was black.

The testes were very much contracted, and depress'd into a kind of thin lamina. The orifice of the uterus was large, in some measure triangular, and surrounded with no protuberating ring. The whole internal surface of the fundus was black and gangrenous.

The thorax was encompass'd with twelve ribs on the right side; but on the left with eleven only. For the first and second of these consisted, in the chief part, of no more than one bone: that is to say, these two, having come out separately from the vertebræ, by their little heads, had scarcely pass'd the length of an inch but they became one broad bone; in which there was not the least appearance of there ever having been any division.

That bone, when it had gone so far, as to be distant from the sternum about the space of three inches, sent, from its upper border, a round oblong cartilage into the sternum; which cartilage was scarcely equal to half the breadth of a little finger: and the bone, being then contracted in its other part, yet so as to retain its breadth; which was not less than that of the first right rib; and leaving a small space betwixt itself and that round cartilage, was join'd to the sternum by another proper cartilage.

In the pericardium was some quantity of water. The right auricle of the heart was distended with blood. The heart itself, even when the fat was remov'd from it, was much larger than it ought to be; and not only on account of the ventricles being wider than usual, and particularly the left, but also on account of the parietes of this last-mention'd ventricle being much thicker than when of their natural size.

Part of one of the mitral valves was become bony; or at least had a little bone subjoin'd to it, which was made up of many bones, as it were, and for that reason unequal, of a roundish figure, and, in its magnitude, equal almost to the point of the little finger. In the heart were some polypous concretions, and a great quantity of black blood: and the same kind of blood, though more fluid, flow'd out, in several places, from the larger veins, when cut into.

Finally, upon examining the upper joint of the lame limb, I found the ligamentum teres, which has so often been mention'd, to be less thick and firm therein, than it naturally is; and to be almost universally ting'd with a pale redness.

18. Another old woman, who was already crooked from age, and who was wont to walk as if she were lame, had lately fallen down stairs in the night, and greatly hurt her head. And this was the cause of her death. As she was dissected, by me, in the same place, before the spring-time of the year 1749, some things were observ'd that relate to the present subject

In the thorax, the trunks of the large vessels were so much on the left side; although the woman was not gibbous, but only crooked with age, as I have said; that I never saw the vena sine pari more inflected to the left side, in order to open itself into the cava.

In the belly, the external surface of the kidneys was not altogether natural: and, indeed, one of them, moreover, shew'd some small hydatids, which were somewhat protuberant therefrom. In examining the genitals, I observ'd that the left nymphæa was not to be found at present, nor ever had existed; and the right was small. The hypogastric arteries were wider than usual, and hard; and one of them was not without an ossification, where it sent out the umbilical artery. When I, at the same time, examin'd the neighbouring iliacs from whence they arise, and saw that the right did not at all differ from its natural state, either in breadth, or in the thickness of its coats; I wonder'd to find the left not only less wide than usual, but, particularly, furnish'd with such very thin parietes, that it seem'd to be a vein, almost from that place where it gave off the hypogastric artery, quite to the part where it came out of the belly.

And this circumstance brought to mind what I had seen in two other women (*m*); although in them, not the arteries, but the veins, were narrower than usual, nor ceas'd to be narrow in the thigh, of which they had been lame. But the artery of this woman, when it had come out from the belly, entirely recover'd its proper width, and thickness of parietes; as I clearly perceiv'd by comparing it with its fellow on the right side.

However, in the upper joint of the thigh, on the left side, I could observe nothing from whence to account for that slight lameness; unless you should suppose that two small and slight contusions, as it were, of a brownish colour, which were distinguish'd in the cartilage that invested the head of that femur, and lay near to each other, might have a relation to this effect.

19. There were two other lame women also, (for it has happen'd to me to find this disease more frequently in them than in men, whether by mere accident, or because, by reason of their structure of body, being less robust, women are more subject thereto) in dissecting of whose bodies I thought that I had found a more manifest cause of that disorder; but I afterwards doubted whether I was not deceiv'd. Be this as it will, I will here first relate to you both of the observations; for they contain other remarks that are not to be doubted, and that were promis'd you by me formerly, amongst those observations that relate to lameness; and then will likewise declare the cause of my doubt.

20. A lame woman, who was not very old, had been carried off by a dropsy, about the middle of December in the year 1746. As I demonstrated, from this body, only the brain, the genitals, and the left limb, of which she had been lame, to the students of anatomy in the hospital; I observ'd no more, in relation to the present subject, than what follows.

In taking out the brain, I observ'd, in the dura mater, where it invested the basis of the cranium, a little before; but somewhat on the outer side;

a little, I say, before the foramen into which the left optic nerve passes, that something adher'd, which, if I trusted to the colour, seem'd to be a small part of the cortical substance. Yet it was not soft, nor was the pia mater, which answer'd to that place, lacerated; but even appear'd to be sound and smooth.

Then attending to it more diligently, I saw it to be a globule, of the bigness of a small grape, somewhat hard in its substance, and solid; nor did it adhere to any thing, but at the lower part of it, as its smoothness shew'd; and by this it was very firmly fix'd to the dura mater only, and not to the bone which lay beneath it: so that I judg'd it to be an excrescence of the same membrane, of a glandular kind, as the modification of its substance shew'd; and the beginning of a tumour, which, if it had increas'd, would not only have injur'd the neighbouring optic, and olfactory nerves, but the brain also.

From the upper and exterior part of the fundus uteri, to the right side, a tubercle was prominent, of the same figure and magnitude which was just now taken notice of, in that excrescence of the dura mater; being equally solid, but white. To this corresponded another, internally, that was pretty soft and low, and manifestly made up of a congeries of vesicles, of the same kind with those we generally see in the cervix uteri; for they were fill'd with the same limpid mucus as these: and this is the tubercle which I promis'd, in the forty-seventh letter (*n*), to speak of here.

The substance of the uterus, which lay betwixt both these tubercles, was perfectly sound. But the other parts, that belong to the genitals; if you except the testes, one of which was less than the other, but both of them contracted, of an unequal surface, and internally and externally white; were not only found; but the lowest of all were nearly in the same state as they are in virgins.

For that part which is call'd the furcula, was tense; the orifice of the vagina was narrow; and furnish'd with a hymen; except that here, contrary to what we generally see, it became less broad, in proportion as it was more distant from the orifice of the urethra; as I shall more accurately describe in another place. Yet this woman did not seem to have had knowledge of a man.

Finally, it was manifest to all who saw the lower limb on the left side, that it was so situated, as to make the toes of the foot be turn'd towards the other foot; nor was it easy for the hands to restore them into their natural situation: and the woman was said to have walk'd by bearing on that part of the metatarsus which is nearest to the toes. But as the foot, the leg, the knee, and the thigh, as far as could be judg'd by looking upon them externally, were free from disorder, and seem'd to be each of a proper length; I laid bare the upper joint of the thigh, and thought that the cervix of that limb seem'd to be shorter than the middle-siz'd stature of this woman seem'd to require.

21. A little decrepid old woman, who was lame also, died about twenty

(*n*) N. 20.

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days after her last spoken of, of an abscess, if I remember rightly, of the arm. Dissecting, therefore, the same and other parts over again, we found the following preternatural appearances.

When I look'd upon the brain, after it was taken out from the cranium, and inverted; I observ'd that the trunks of both carotid arteries, and the larger branches thereof, appear'd very firm: and I found that the parietes thereof were really become much thicken'd. On the other hand, though the nerves, and particularly those of the fourth and fifth pair, were very fine, firm, and thicker than usual; yet I saw the optic nerves to be depress'd into the form of a thin bandage, narrow, and of a cineritious colour; and that medullary part, which is interpos'd betwixt them, where they join one another, to be pretty broad indeed, but not at all different from them in colour, or thinness.

And they themselves; though when they had gone within the orbits, they were of a white colour, and of a moderate kind of thickness; when cut into, nevertheless, shew'd that whiteness, and a considerable part of that thickness, to be owing to their meninges being become thicker than usual: within which meninges, as within a pretty firm kind of tube, was contain'd a bloody substance, particularly in one of the nerves.

As the eye, to which this nerve went, as well as the other, shew'd no disorder when look'd upon externally; so neither did it shew any internal disease, when it was dissected by me: so that I very clearly perceiv'd this disorder, which I have describ'd to you formerly (*o*), in the optic nerves, not always to have its occasion and origin from diseas'd, and perfectly blind eyes, (for they affirm'd that this woman, surprising as it is, was not blind, unless it was that she saw a little with the other eye) nor yet from the brain, but that it first arises, sometimes, in the nerves themselves (*p*).

In this woman, at least, though I accurately dissected the brain; within which I could scarcely follow these nerves, by reason of their thinness; I met with no disorder in their passage, or in their thalami. And although I observ'd the hippocampi, at their lower and extreme part, to be not at all dilated, as they generally are, yet there was not the least reason to believe but they had been so from the original formation.

And besides this, there was nothing unusual, not to say morbid, in the whole brain: except that in the fourth ventricle, instead of those medullary fibres, which occur on both sides, for the most part, and go to the acoustic nerves, there was but one on each side, and that slender, rising, and having its situation lower than usual.

In the lower jaw I observ'd some things; which, in this letter in particular, where we treat of luxations and fractures of the bones, ought not to be omitted. For the small head of this bone, to the left, grew out from one side of its superior surface upwards, as if from a new additamentum; as I have heretofore said (*q*) was seen by me in the internal parts of the cranium of a certain old woman; for this bony excrescence also was white and firm; and,

(*o*) Epist. 13. n. 7. & seq. & Epist. 52. n. 39.

(*p*) Vid. Epist. 63. n. 8. in fin.
(*q*) Epist. 27. n. 2.

besides, like the remaining part of that head, incrusted with a thin and very smooth cartilage.

If this additamentum had been rais'd up, more and more, by its increase, there is no doubt but it must have thrown the head out of its sinus; or, at least, that it must have very much incommoded the motions of the lower jaw. And indeed that it had, in part, begun to do so already, this perhaps was a testimony; that the moveable cartilage, which lies betwixt the head and the sinus, appear'd, in the middle of it, to be cut with a knife, as it were, in two places; in one longitudinally, in the other in a transverse direction, and obliquely.

And I said perhaps, even because the cartilage, answering thereto in the right joint, was pierc'd through with a very small foramen, in the form of an ellipse, and shut up by no membrane, (though I know that a larger than this was seen formerly (r)) and although this was situated in the middle, but nearest to one of the extremities, and placed longitudinally, I nevertheless evidently demonstrated, that, in this subject also, neither of the cartilages consisted of two.

But as, besides the dentes incisores, this old woman had no tooth left; having shewn the whole part of that jaw, on both sides, which had been formerly furnish'd with the other teeth, not only to be without all traces of sockets, but to want that portion of the bone in which the sockets formerly had been; so that the foramina, through which the nerves go out (they are call'd *foramina mentalia*), were now almost in the upper and external margin of the jaw; and therefore that the height of this bone was greatly reduc'd, as is very clearly observ'd and represented by Ruysch (s); I added, that it follow'd from hence, in regard to those persons, in whom the body of this bone has thus decreas'd after the loss of the teeth, that in them, unless a greater hardness of the bone, on account of the advanc'd age, prevent it, the whole of the bone, on that part, must be much sooner, and more easily, corroded, sometimes, by a supervening caries; or broken by a pretty heavy stroke.

Upon examining the thorax, I shew'd four arteries to arise from the curvature of the aorta; for the vertebral artery of the left side did not arise from the left subclavian, which was much more thin than the right, but, betwixt that and the left carotid, yet nearer to the former than the latter; and as this circumstance has occur'd to me in another woman, of whom we have spoken above (t), and in others also (u) sometimes, it does not seem to deserve a place among the more rare appearances.

But the great artery, betwixt the heart and the right subclavian, was manifestly dilated; and when it was cut into, quite to the septum transversum, it shew'd, here and there, in several places, larger or lesser spaces, somewhat prominent internally, and of a white colour; wherein the more compact substance of the artery would afterwards have been chang'd into a bony substance.

(r) Vid. Stephan. cit. in Advers. II. An. mad. 28.

(s) Obs. Anat. Chir. 82. & Fig. 65. 66.

(t) n. 10.

(u) Vid. Epist. 3. n. 20. & Epist. 15. n. 25.

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At the upper part of the genitals, and within one of the testes, was an hydatid, of a considerable size; so that it extended itself to make up a part of the surface of the testis: and, at the lower part, the orifice of the urethra, from whence the internal coat of that tube; in the same manner as the internal coat of the vagina, or rectum, sometimes is; having inverted itself in a small degree; was prolaps'd outwardly on one side: and this I have already said (x) I had seen in another woman, as well as that I was to speak of this woman in the present letter.

Last of all, the right limb, of which she had been lame, was shorter than the left: and being, as in the former woman, turn'd inwards, seem'd to have the same cause of this disorder as in the former; I mean the shortness of the neck of the femur.

22. And thus it really seem'd to me at the time; and perhaps I was not entirely deceiv'd. But I was displeas'd with myself afterwards, that I had not compar'd the neck of the lame thigh with the neck of the sound one: which would have been the only proper method of demonstrating, whether I had, with justice, suppos'd the former to be shorter than natural, or not. For perhaps that might seem shorter than usual, which was of a proper length, and well-proportion'd to a body of no large stature: and there are so many causes of lameness, not only above the acetabulum, but in the acetabulum, and below the acetabulum, that, although I saw many of them to be absent; yet perhaps I could not sufficiently discern whether all of them were absent or not. And I choose here to take notice of the greatest part of them, in that order which was just now referr'd to.

Above the acetabulum is any deprav'd situation whatever of the os innominatum; a situation of which kind was added to the other disorders, in those two lame women whom I describ'd above, before the others (y), particularly in the first. And the celebrated Baffius (z) produces many examples of a diastasis, or separation, of the os sacrum, from this bone, in children that are lame; adding the reasons why this easily happens to infants, the signs whereby it may be distinguish'd, and the causes for which it is difficult to be cur'd, and therefore may remain through the whole of life; as in a Venetian young man who was brought to me for the sake of taking my advice, I saw that it had remain'd from childhood, and judg'd that it would always remain.

And if you consider duly these things; whenever you see that one limb is manifestly longer or shorter than the other, and the cause of this inequality is not manifest in the limb itself; you will first of all examine whether the situation of the ossa innominata is unequal; for this situation is follow'd by that of the acetabulum, as it is hollow'd out in these bones, and that of the acetabulum by the limb; lest by supposing those bones to be alike in their situation, which are not so either naturally, or by the force of disease, you are soon after deceiv'd, in judging whether the limb itself be really longer or shorter than it ought to be.

(x) Epist. 50. n. 51. Vid. & Epist. 70.
n. 10.

(y) n. 10. & 12.

(z) Dec. 4. Obs. Anat. Chir. 2.

23. And in the acetabulum itself, you very well conceive, from what has been more than once said above, that the capacity and figure of the ligamentum teres, and the head of the femur, may be diseas'd in many ways. And to these things we must add tumours, whether they are form'd in the ligament, as our Falloppius (*a*) hints; or in any other part within the acetabulum, as our Vellingius likewise (*b*) in general says; where he says, that he had frequently visited, with Sala, a Venetian nobleman, "in whom a tumour having arisen within the acetabulum of the coxendix, the head of the femur was evidently push'd outwards."

And Valsalva, in an opinion which he wrote for a noble youth, in whom the left limb was become longer than the right, suspected that the mucilaginous gland of the acetabulum had gradually become tumid; not only because in a boy, in other respects sound and healthy, he did not think it probable that the ligaments were relax'd, but because it is so natural to the glands to swell: and last of all, because, after laying in bed a long time, in consequence of an acute disease; that limb was found to be very much longer than before, which he accounted for from the increase of the gland, by reason of being so long uncompress'd by the head of the femur; he therefore advis'd, among other things, that the shoe under the right foot, on which the child us'd, for the most part, to bear firmly, when standing, should be so much higher than the other, as to make both the limbs equal, and enable him to bear on the left also, and compress the gland.

But in a foldier, whose case was publish'd at Hall, and which has been quoted above by me (*c*), a kind of spongy substance was really found; which by filling more than half of the acetabulum, had forc'd the head of the femur from thence.

24. Finally, under the acetabulum itself there are many more causes of lameness. For, to omit mentioning the fracture of the cervix femoris, whereof we have spoken, and the diseases of the capsular ligament, as it is call'd, the muscles, in the first place, which preserve the thigh in its situation, if they are paralytic, do not prevent the very weight of the whole lower limb from extending the ligaments, and drawing the head of the femur downwards: or if they are contracted by pain, tumour, or convulsion, they keep the head of this bone buried so much the deeper, and press'd up so much the closer, in the acetabulum, as to make the limb seem a little shorter than it really is.

And with how great a force the same muscles sometimes act, even by the natural government of the will, is demonstrated, in particular, from the case describ'd by Ingrassias (*d*), of the lesser trochanter of the thigh being pull'd away from the other parts of the bone, by some only of those muscles which a young man, of noble birth, had immoderately strain'd in the exercise of tilting: and this case becomes less incredible by the figures of Ruysch (*e*) more than by others; in which he represents the same trochanter, that had separated from the os femoris of a young man by boiling.

(a) Pinæfat. in Tract. de luxat. & fract. Ossium.

(b) Eriß. 25.

(c) n. 15.

(d) in Gal. 1. de Ossib. c. 20. Comm. 4.

(e) Theat. Anat. 5. Tab. 2. fig. 2. & 3.

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Indeed any fracture of the femur itself is so rarely cur'd, without a lameness being the consequence thereof, that Celsus has expressly said (*f*), "we must not be ignorant that, if the femur be broken, it becomes shorter; because it never returns afterwards into its former state: and that we tread, for the future, on the upper parts of the toes of that leg."

And it becomes shorter, because betwixt the extremities of the fracture some part is lost, which has been shiver'd into fragments; or because those extremities are adapted to each other with so much difficulty, in such a manner as to preserve the natural figure and position of the bone; as in that femur in particular, the figure of which is publish'd by Grutzmacker (*g*): or because even when well adapted to each other, the extremities are afterwards mov'd asunder by the action of the muscles, which very easily happens in an oblique and oblong fracture; whereas in a transverse fracture, one extremity pushes against the other, so that by this means they are mutually preserv'd in their restor'd position.

To these other causes of that kind, Valsalva added this; that in those oblong and oblique fractures, which are brought on by great violence and impetus, some fibres of the neighbouring muscles may sometimes be intercepted betwixt two parts of the fractur'd bone, so as to hinder an exact coaptation and coalition; or even retard the coalition for a very long time. But although none of these things which have been mention'd may happen, or though none of them may happen in that manner which we speak of here, so as to make the os femoris shorter than it naturally is; yet lameness cannot be avoided, if the muscles, the tendons, or the nerves, being very much weaken'd by the fracturing cause, or by the consequent inconveniences, either cannot move the thigh, or the parts which lie beneath it, with a proper strength, or in a proper manner.

25. It is also manifest, that even the parts which lie beneath the femur, are not only liable to most of those diseases that are mention'd, but bring on lameness in the person so affected. It will therefore be sufficient for me to say much less of each of them; beginning with the joint of the knee; which, however, is a part that belongs in some measure to the thigh.

26. A woman, of whom mention is made in the fifty-second letter (*h*), though her history was deferr'd to this letter, because she could not bend one of her knees; having receiv'd a violent blow on her forehead, which the worst kind of symptoms were immediately the consequences of, had these symptoms disappear; and lay ill in the hospital, of so slight a fever, that on the seventh day she ask'd for a less slender diet. But on the fourteenth day, behold a more violent fever attack'd her, with a coldness and perturbation of mind: and death follow'd on the seventeenth day, there being never any symptom, either in these latter days or in the former, of the thorax being affected; and no complaint of this kind being made.

It was now the month of December in the year 1745: at which time, as it was my annual custom to demonstrate a great number of things to the pupils in the hospital; and as these requir'd the dissection of the thorax,

(*f*) De Medic. l. 8. c. 10. Sect. 5.
(*g*) Dissert. de Off. Medulla,

(*h*) n. 9.

the belly, and the limbs, they did not allow us time to dissect the head; it was not therefore open'd. But in the dissection of those other parts these preternatural appearances were observ'd.

One of the thoracic cavities had almost four pints of water, of a middle colour betwixt green and yellow; but the other much less: the lungs in both of them being perfectly uninjur'd. In the pericardium was the usual kind of moisture; nor more than that: but the heart was lax: and in the right auricle thereof was a polypous concretion of a white colour, thick, and compact. In the belly scarcely any thing was observ'd, besides an inclination of the uterus to one side,

Finally, after having compar'd the limb; the leg of which could not be bent even by my hands, being prevented, in appearance, by the knee; with the sound limb, and not being able to find any external difference by the eye, except that the rotula was somewhat more prominent than usual; I determin'd first to try whether the extensor muscles of the leg, whatever was the cause of the disease, could act in such a manner, as to prevent, by this contrary action, the knee from being bent.

Cutting these muscles therefore transversely, at a little distance above the knee, the leg could immediately be bent. And yet the knee, as the prominence of the rotula, which still continued, demonstrated, was not wholly free from disease. For the rotula was prominent, because the external condyle of the femur was not only longer from the posterior to the anterior part; which was manifestly prov'd by comparing it with the external condyle of the other femur; but was even prominent forwards, more than it is wont to be at other times. Yet on the other hand, it was equally prov'd, by comparison, that the lateral external ligament of the knee was much thicker in the other knee than in this.

27. As it has been sufficiently pointed out in the letter which I just now refer'd to, from whence that water in part, and its filthy colour, could be brought into the thorax; and as the other circumstances in the observation in question, are sufficiently clear of themselves; I will mention some things of the contrary affection of the knees, and of some of their diseases.

The knee of which we spoke just now could not be bent. And the illustrious Haller (*i*), having lit upon another which could not be extended, found no other cause of this impediment, "but a hard and almost tendinous celulosity," on that part, I suppose, or at least most on that part, which was posterior in the limb.

That the rotula should be very frequently broken transversely, as most generally happens; is not at all to be wonder'd at, when in consequence of violent blows; but this is surprizing, that either from a violent and sudden contraction of the muscles which extend the leg, or from the resistance of them, this very bone is sometimes broken; or the strong tendons of the muscles are broken asunder above it. An example of which kind of rupture you will read in the celebrated Bassius (*k*); and before him two in Ruysch (*l*); in

(i) Opusc. Pathol. Obs. 50.

(k) Dec. 3. Obs. Anat. Chir. 6.

(l) Adv. Anat. 2. c. 2.

whom (*m*), and in Palfin (*n*) ; not to mention other authors besides those that are in my hands while I am writing ; you will find observations of this kind of fracture.

The celebrated Bassius (*o*) has also observ'd, that the femilunar cartilages, which lie in the joint of the knee, betwixt the femur and the tibia, may sometimes grow out, from an afflux of humours, and bring on a lameness.

And, finally, in regard to those who are bandy-legg'd, to omit what Severinus has written at large (*p*) ; Ruysch (*q*) found, in an adult who was bandy-legg'd, the cavities of the upper part of the tibiæ, which lie beneath these cartilages, not equally depress'd to receive the condyles of the femur ; and, consequently, both those bones situated in a different manner from their natural disposition : which circumstances will better appear from the figure (*r*) than from the description.

For I have taken notice of these things, that you may be more fully inform'd, from the books of those that I have quoted ; and may learn from thence the signs by which you may distinguish them, and how and when you may undertake the cure ; and, on the contrary, when the time is past in which it was in your power to be of service.

Nevertheless, in some of those instances which have been mention'd, and particularly in the fracture of the patella, and the rupture of the tendons that extend the leg, a length of time is of more use sometimes, than we could hope or expect : and this it happen'd to me to see, in two persons, some years ago.

The first was a tall and fat man, who leaping down, some years ago, from a chariot, and fracturing his right patella transversely, had applied to the art of surgery in vain ; till having sent for that most excellent professor of surgery in this college, Jerom Vandelli, on the twenty-second day after the accident, he brought the upper part of the rotula to the lower as much as he could ; so that the one might be distant from the other by a much less interval than before ; and confin'd them in that part by the help of bandages.

This interval was about a finger's breadth : and therein nature herself gradually generated something, whereby the parts of the rotula might be firmly connected to each other. The man, therefore, made use of that limb freely ; when happening to fall down upon the steps of a certain bridge at Venice, and bending that leg violently and strongly, he heard a noise as if of something being ruptur'd in the knee : and the fact was, that by this violence of flexion, whatever it was that had kept the parts of the rotula connected together was ruptur'd.

The surgeons, finding it in vain to attempt to bring the broken parts so nearly into conjunction, as they had been a little before, at length, endeavour'd to make the joint as firm as possible by applying an instrument to the knee, and strengthening it by means of the clay from the baths near Verona. And after a long space of time, the man, who had suffer'd great

(*m*) Obs. Aat. Chir. 3.

(*n*) Anat. du corps hum. tr. 5. ch. 17.

(*o*) Dec. 2. Obs. 5.

(*p*) De recond. Abscess. nat. l. 6. P. 2.

(*q*) Advers. 2. cit. c. 6.

(*r*) Ibid. Tab. 1. Fig. 2.

pains from both falls, and could not at all use his limb, had gain'd so much advantage, that he makes use of it now, without any instrument, and without any trouble or uneasiness: and this, whether he stands, bends his knee, or walks; which he does with great expedition, being but slightly lame on that side.

In examining this knee with accuracy, I found the parts of the rotula, which were almost equal in size, disjoin'd from each other by a very considerable interval; and that much greater still when the knee was bent: for where the rotula ought to have been, there then appear'd a cavity, which was extended about two thumbs' breadths in length, and not less in width; being about a finger's breadth deep: so that we could perceive, by the touch, the condyles at the lower part of the femur, and the upper border of the tibia.

This gentleman was brought to me by the professor before-mention'd, that I might see the circumstances I have related: and he said that I might likewise, if I pleas'd, see the same things nearly, in a certain servant-man at Padua.

But the second of the patients of whom I spoke above, was a noble Venetian, whom I saw in conjunction with the professor before-mention'd; being desir'd to consult what method might to be made use of, to strengthen his knee. This gentleman, after two falls, by the first of which his rotula was said to have been broken transversely, and afterwards to have coalesc'd by the help of art; though it was certainly wholly drawn upwards by the second; now walk'd expeditiously, and in an upright posture, through even places, like other men, and without any support; but had not yet gain'd much ground in going up stairs; for though he could go up, he could not go up with equal expedition.

In this patient also, when he stood, in the very seat of the rotula, which had been drawn up from thence, as I have said, a cavity occur'd to the eye. And I did not doubt but the prominent sides of this cavity were, as in the former man also, the very large lateral parts of that aponeurosis, whereby the muscles, extending the leg, are inserted thereinto: and to these parts it seem'd, that whatever motions either of the patients perform'd without the rotula, were to be ascrib'd.

That is to say, it had happen'd to both of them, that the intermediate part of the aponeurosis was broken asunder, without any injury being done to the lateral parts: to the former of them, in that part where it envelopes the rotula, to which it very firmly adheres; but to the latter, as far as I saw, betwixt the rotula, and the tuberosity that is prominent in the tibia.

Nor do I think that this inferior part, which I know that others also have seen ruptur'd more than once, is made less liable to be easily broken, by the ligament which most authors suppose to be under it, going from the rotula to that tuberosity. I, at least, notwithstanding I have look'd for it very diligently, and frequently, in bodies, could never be so keen-sighted, as very clearly to distinguish any thing that differs from a tendinous nature, in the fibres of that aponeurosis; or any thing that could properly and strictly be call'd a ligament.

Wherefore, I am still of the same opinion with Vesalius (*s*), who expressly says, “that the patella is join’d neither to the femur, nor to the tibia, otherwise than by the interposition of tendons: and that the patella has this in peculiar to itself, that it is not connected to any other bone by the help of ligaments.”

And I could wish that, as Weitbrecht (*t*) has profess’d to follow this very great anatomist in this place, he had also follow’d him more constantly. However, this is not the place to examine some passages in his otherwise excellent book, entitled, *Syndesmologia*, which relate, for the most part, to the too great facility in supposing ligaments; at other times, to dissensions that are not at all necessary; and, sometimes, to a silence that is rather unjust. Now let us go on with our purpose.

28. How far the bones of the leg, also, may be prejudicial to walking, and how far they may be the occasion of lameness, no one is ignorant; I mean, where the fracture of either of these bones is improperly cur’d, and particularly the fracture of that which is the chief of the two; I mean, of the tibia: from the diseases of which I said, just now, that men became bandy-legg’d likewise.

And although, by reason of the natural straitness of these bones, it is more easy to cure a fracture of them, in such a manner that the limb may not be unlike the other either in figure or in length, than that of a curv’d or inclin’d bone, such as the thigh-bone is; yet if the fracture is oblique, it very easily happens, that the limb becomes shorter, and sometimes distorted.

And for this reason, some of my countrymen, in my memory, have chosen rather to suffer what many formerly suffer’d (*u*); I mean, that their bones should be broken again, and put in a better direction; and I know that this has succeeded well with some: but, on the other hand, I know a physician here, not without erudition, who having permitted the bones of his leg, which were beginning to coalesce, to be broken again by the hands of the surgeon; brought on himself the most violent symptoms, and death.

You will, perhaps, ask me at what time fractur’d bones begin to coalesce, and at what time they come to a perfect consolidation with each other? But this, in my opinion, is a thing of such a nature, that, if we consider the mode of coalition, the time cannot certainly be defin’d. For consolidation; to set aside the consideration of gravid women, in whom we read not more than one example of a fracture being consolidated in that part, where we read many of its not being consolidated (*x*); for consolidation, I say, will not begin, or be perfected, so soon in diseas’d as in sound bodies; nor in sound and healthy bodies, in like manner, with equal celerity, in old men as in young men; or in all those who have not the same fracture, or are not treated with the same method of cure.

(*y*) De corp. hum. fabr. l. 1. c. 32.

(*r*) Syndesmolog. S. 5. § 13. cum notula m.

(*x*) Eph. N. C. Dec. 1. A. 1. Obs. 25. cum Scholio.

(*u*) Vid. Celsum de Medic. l. 8. c. 10. prope fin.

Nor, indeed, does experience teach us otherwise, if we attend to the experiments which the celebrated Du Hamel (*y*) has made on brute animals. For in a diseas'd animal, he found the callus, on the fifteenth day from the fracture, not perfect, as in others, at an equal distance of time from the fracture; but equally imperfect as in another on the tenth day. These animals were both young pigeons: the bone was the same: and had been broken, replac'd, and tied up in exactly the same manner: for in those where it was very streightly tied up, either a gangrene, which Celsus (*z*) foretels from too tight a bandage, brought on death before the cartilaginous firmness of the callus could appear, as this was not observ'd in the others before the fourth day; or even on the eighth day (*a*), on which the callus began to be bony in others, there was not the least beginning of any callus: but every thing was in the same state as if the bone had been just then broken.

29. And all these experiments, as well as many others, that very experienc'd man explains, by accounting for the callus; not, as others do, from the bony fibres producing themselves, or from the bony juice which distils from these fibres, or from the blood which is effus'd and adheres to the fractur'd bones; but, according to his own observations, from the external or internal periosteum, becoming tumid and thicken'd at the place of the fracture; and changing its laminæ, first, into a cartilaginous, and, after that, into a bony firmness.

But in regard to this firmness of the callus; whether you should chuse to explain it according to the observations of Du Hamel, that I have commended; or whether you should chuse to explain it according to the observations of that ingenious man Dehtleefius (*b*), which well deserve notice; you will not doubt but we must think in the same manner of this, as we have said of the beginning and completion of the callus: I mean, that, according to the various conditions, which are mention'd, and others of that kind; to which the longer or shorter time, also, from that of its being completed must be added; the callus may be more or less compact, or, at least, more or less hard and firm.

And by these means, I think, that the opposite opinions of many very celebrated men are to be reconcil'd to each other. For there are some who assert that the callus is of the same firmness as any part whatever of the bone; and that even, if it be of a diameter, as it often is, larger than the bone, it is so much the stronger in proportion to its diameter being increas'd; and that this is prudently provided by nature, because the fractur'd bones, being very rarely replac'd according to their former direction, would otherwise be more subject to a new fracture in that part; and might coalesce with difficulty in the same place again, because the callus is destitute of a vascular structure.

To lay aside which opinion, (not only because, according to the observations of Du Hamel, the callus does not seem to be deducible from bone,

(*y*) Memoir. de l'Acad. R. des Sc. A.
1741. Mem. 1.

(*a*) Mem. 2.

(*z*) C. 10. cit. S. 1.

(*b*) Dissert. exhib. ossium calli generationem, &c.

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nor from callus, but from the periosteum, as we have said ; but also because a surgeon of some eminence affirms, that, when the former callus is broken, a second is form'd sooner than the former) and to attend to this one thing, that the callus is said to be not less resisting and firm, at least, than the bone itself; there are certainly many other grave men, who advance things which do not at all agree therewith.

For see how Celsus (c); in order to lessen the too great quantity of callus; which is form'd upon bones that are rightly glutinated to each other; applies such things to the limb, as, if the callus were of a bony hardness, could be of no effect; as, for instance, long and gentle frictions of oil, salt, and nitre: various fomentations of warm salt-water, digestive malagmas, and tighter bandages.

Or if you do not think that these things were useful; you will read Du Hamel (d) asserting, that a dripping of water was not only frequently useful for that purpose; but also that, where there had been too free a use of it, it had soften'd the callus to such a degree sometimes, that the two extremities of the bone, which had coalesc'd with one another, were spontaneously disjoin'd again.

But whether these calli were either not of a very large diameter, or were very recently form'd, as that of two months growth, and but little prominent, in the leg of a young lamb, which was uncemented by being put into a pretty acid lixivium, during the ebullition, as mention'd by the same Du Hamel (e); at least, those two, which the Sepulchretum (f) describes from Rolfinc, in the thigh-bones of a certain dead body, were of a very considerable and monstrous bulk and diameter, and not at all recent, as appears from the relation: yet in this body, "when boil'd after dissection, in order to reduce it to the structure of a skeleton, both of these calli were "mutually and totally separated."

And that observation which was communicated to Salzmann (g), by an eminent surgeon, deserves particular mention in this place. A soldier had been cur'd of a fracture of the tibia, by means of so firm a callus, that he could walk and bear upon the limb which had been fractur'd, as well as upon the other, and without the least inconveniency of any kind; when happening to be seiz'd, eight months after, with an acute fever, and being brought into the same hospital wherein he had lain before with the fracture, it was observ'd, that while the fever was counteracted by the usual course of remedies, the extremities of the bone were again spontaneously disjoin'd; the callus being gradually consum'd, as it were, by the febrile heat: and although these extremities could not be re-agglutinated, during the continuance of the fever; yet, soon after, when the fever was remov'd, the tibia was restor'd to its former state of soundness by nature itself, without any great apparatus either of remedies, or of bandages.

Finally, the compages of the callus itself, when examin'd in dead bodies, is sometimes of such a nature, that, notwithstanding its diameter is found to

(c) In fine c. 10. paulo ante cit.

(d) Mem. 2. cit.

(e) Ibid.

(f) Sect. hac 5. Obs. 1. § 8.

(g) Differt. de Artic. Analog. &c. c. 2. § 7.

be much larger than that of the bone to which it has grown, it is far more fragile, nevertheless. Nor is it a substance of hard bone, but a spongy substance, such as is seen betwixt the two laminæ of the cranium.

A callus of this kind being describ'd, and represented in a plate, by Ruyſch (*b*), in the wing of a hen, and a duck; this author says, "That he had also observ'd the same thing in men sometimes: so that we must not give too much credit to those who suppose the callus of fractures to be always so exceedingly firm, that bones formerly broken, and glued together again, are, if they undergo a second fracture, sooner broken in any neighbouring part, than in the callus spoken of:" and he does not doubt but from thence it is, that some persons receive a fresh fracture from the slightest occasion, after the conglutination "of fractur'd bones:" and even merely by walking.

But if you wish for many examples of the structure observ'd in *calli*, and of the wonderful length that they sometimes have; you will, I believe, scarcely find them in a larger number, in any other authors, than in the learned Jo. Beniam. Boehmerus (*i*). Yet this number you may increase, I think, as far as relates to the structure, by the observation of that celebrated man Alexander Camerarius (*k*), on the thigh-bone of a child; and, in respect to the length, by the example given by Jo. Jacob. Bajerus (*l*), on the lower jaw of a miller; the callus being "about the size of three inches, from the chin to the middle."

30. Now to return from the circumstances that happen to broken bones, not of the leg only, but to other bones also, and to come to the peculiar fractures of those bones; I will subjoin an observation, which contains a kind of rare circumstance besides.

31. A rustic old man, of a pretty fat habit, had fallen from a tree upon his feet, while he was pruning a vine; and had broken his right leg in such a manner, that the bones were prominent on the internal side, a little above the foot: and this through a wound which they themselves had made. These bones being replac'd in the best manner they could be, the man was carried into the city, and into the hospital, in the cold season of the year; for it was about the middle of February, in the year 1736. As he, therefore, was expos'd to the injuries and inclemencies of the weather also, he could not be sav'd; but was carried off within four days after the fracture.

Although the anatomical demonstrations, which I was then giving in the theatre, began to draw to a conclusion; I was not, however, willing to neglect the opportunity that was offer'd me, of examining the viscera of a body of this kind; and of inspecting the diseas'd limb. In which parts I observ'd the following preternatural appearances.

The abdomen; which was somewhat tumid the day after death, for no other reason, however, but because the air included in the intestines, made these somewhat tumid also; when it was cut into and laid open, shew'd the omentum to be so drawn upwards, as not to descend below the transverse

(*b*) Theſ. Anat. 8. n. 49. & Tab. 3. Fig. 5.
& Catalog. Rarior. Theca B. Reſpoſ. 2. n. 2.
(*i*) Diſſert. de Offium Callo.

(*k*) Aët. N. C. Tom. 1. Obſ. 53. verſ. fin.
(*l*) Eph. N. C. Cent. 7. Obſ. 4.

part of the colon, which it cover'd. The spleen was larger than usual, and easily to be lacerated.

The liver was pale, and in whatsoever part it was turn'd to the diaphragm, so closely connected therewith, that the membranes which invested both of these parts, did not seem to be two, but one only. The gall-bladder was oblong, and fat, although of a bright yellow colour externally; yet it contain'd bile that was of a yellow colour inclining to green, and fluid, but not fæculent: and contain'd, though in a man who had not been icteric, nineteen calculi.

All these were in the fundus, nor were any elsewhere, unless a very small one lay hid in a certain gland, betwixt the coats of the cyst, as a black point, which was seen through the coats, in one or two places of the internal surface, seem'd to prove. But those of which I had begun to speak, were all somewhat round in their figure, small in their size, black in their colour, and granulated on their surface, resembling nothing more than ripe mulberries.

These calculi being then thrown into water by me, they all of them immediately went to the bottom, and continued quiet there. But being presently taken out of the water, and laid on it after some days; not thrown upon it; they subsided somewhat more slowly, and emitted bubbles: and being laid upon the water, in the same manner, two months after likewise, they remain'd very long on the surface.

At which time, applying one that was dry to the flame of a candle, it did not catch the flame, but only sent forth some sparks, and the disagreeable odour of a burnt feather, and was withdrawn from the flame nearly in the same state it had been in before. However, some fragments of the others were become not at all softer by a two months maceration in water; and retain'd the same firmness always.

You may add these remarks to those which I formerly wrote to Schroëckius (*m*), upon cystic calculi.

But now take that circumstance which I said was very rare; at least I never saw it but in this body. The trunk of the inferior vena cava, where it became one by the junction of the iliac veins, did not occupy the right side of the lumbar vertebræ; as it always us'd to do; but occupied the left side, and went on to the left of the great artery, till, bending itself obliquely to the right side, over the anterior surface of this artery, immediately under the superior mesenteric, it return'd to its usual situation on the right side.

From this inflexion it happen'd, that, although the left emulgent vein open'd into the cava, two or three inches lower than the right emulgent, if you extended the cava into a strait line; yet the left kidney had not a much lower situation than the right. As I should have been surpriz'd at this passage of the vena cava, over the surface of the aorta, in any body whatever; I could not sufficiently admire the circumstance, in the body of a man who had grown old in the continual and hard labours of a country-life. However, the aorta had some little hardness at its division into the iliacs; and in like manner at the mouth of the superior mesenteric.

Upon opening the thorax, the lungs seem'd to be in a sound state, notwithstanding they every where adher'd to the pleura very closely; whether this membrane invested the chest, the sides, the back, or the diaphragm; nor was any disorder observ'd in the neighbouring heart.

Last of all, I examin'd the broken leg. It did not swell a great deal. The tibia, and fibula, were both broken, a little above that place where they are join'd to the foot; the fracture being continued longitudinally, but not in a direct line. Yet there was not a great quantity of blood extravasated thereabout: nor were the odour, and the colour, bad in their appearance.

32. I examin'd this fracture, not because in an adult man, and an old man too, I expected to see any thing, so soon, that related clearly to the incipient callus; but rather with a view to other things; and to this among the rest, whether, if any fragment had been disjoin'd from the bones, this was involv'd in a kind of mucous humour, as I had read in Valsalva's papers that he had found it to be involv'd.

There is also this remark in a certain letter of his, that relates to the present question: where a fracture happens to be complicated with a wound, the blood should be suffered to flow out; for by these means the bones and the flesh would be more easily join'd together: and it was for this reason, he says, that in the case of a broken thigh and tibia propos'd to him, the former had been consolidated sooner than the latter, because the fracture of the femur was join'd with a wound, by which the blood had been discharg'd; and the fracture of the latter was not.

And now that I have begun to remark these things, I will not omit that which was related to me by a surgeon of some eminence, in regard to himself. His leg being broken, and the bones being again replac'd, and properly dispos'd, he first observ'd, that, at the end of an hour after the surgeons had bound up the leg, his pain was increas'd: and as they denied, upon examination, that this could be owing to the bandage becoming more tight in the mean time, he perceiv'd that it was owing to a stupe which they had laid around it, moisten'd with the white of an egg after being beaten up; and which, while it was growing dry, press'd some of the bony fragments to the sensible parts that lay around them.

And in the second place, he had observ'd, that while those who were about him walk'd too and fro in the room, the pain was increas'd by the tremor of the room and the bed; and that his fear was always increas'd, lest this tremor should be injurious to the conglutination of the bones.

And finally, when his fracture was perfectly cur'd, that he had an uneasiness and difficulty remaining in his heel for a very long time, when he attempted to walk; though he was a young man, and in other respects in good health: and that because sufficient care had not been taken, through the whole course of the long time, wherein he had kept his leg immoveable, to prevent his pressing upon the heel: and from hence you will learn why ingenious and attentive surgeons would have the heel of the fractur'd limb be laid quiet and easy in a foramen, form'd by the convolution of a stupe, or soft rag, into the form of a ring; so that the patient should not support the leg immediately upon the heel.

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33. "That both bones of the leg are sometimes luxated near the foot," has been asserted long ago by Hippocrates (*n*): and that luxation would certainly make the limb shorter, if at any time they were so disjoin'd, that the astragalus ascended betwixt the two: yet that this cannot come to pass, unless, besides the most violent symptoms, the foot appears to be very evidently carried to the external side of the leg, is sufficiently demonstrated in a certain response of mine: and if you read this in the work of the celebrated physician who has publish'd it, you will, I imagine, perceive the case to be so clear, as not to think necessary that I should add any thing on this subject here.

34. Hitherto I have written so many things upon the lower limb, that unless we should choose to be very long, we must add only a few things of the upper limb, and of the vertebræ. A part of which, however, will belong to the lower limb likewise, as you perceive that part of what has been said may be transferr'd to other bones likewise. For in the number of these things also is that which I have taken notice of from Columbus (*o*), I mean that the epiphyses are easily separated from the bones in children. And he who does not attend to this, may be sometimes deceiv'd in them, by taking these separations for fractures.

I remember this to have happen'd to a surgeon, in other respects experienced; who, seeing both the arms of a noble boy tumid at the wrists, and perceiving, by examining with the hand, that, beneath a kind of fluctuating humour, the extreme parts of the radius and ulna were there become moveable; accus'd the woman that us'd to carry him, of suffering the child to have fallen out of her hands, and to have broken both its arms.

But as she constantly denied it, the parents, not knowing which of them they should believe, begg'd of me to hear the relation of the surgeon; and judge whether he might be deceiv'd or not. As they, during their conversation with me, had said that the child had labour'd, some little time before, under a very violent kind of small-pox, and this was confirm'd by the surgeon; see, said I to him, I beseech you, lest abscesses, which follow'd the small-pox, should have separated the epiphyses of these bones, by eroding the periosteum, whereby they were connected therewith: for Parey formerly saw this circumstance happen, not only from other internal causes, but in particular, "frequently from the small-pox;" and as that passage of Parey, which relates to this question, is transferr'd into the Sepulchretum also (*p*), I wonder how it should escape men, in other respects very learned, who have quoted surgeons of later date than Parey upon this subject.

You ask me the event of the case. It was just as I suspected; the surgeon himself ingenuously confessing soon after, that my admonitions were true; and thereby meriting the praise of an ingenuousness, which many others would not condescend to obtain, not only when I have suspected, but even demonstrated, their errors. However when the disease was known, the child was perfectly cur'd soon after.

(*n*) 1. de Fractur. n. 14. apud. Marinell.
(*o*) supra, n. 2.

(*p*) Sect. hac 5. Obs. 1. § 7. cum Schol.

Moreover, in regard to "the separation of the epiphyses, in consequence of the small pox," as I know that some observations are extant even in a Programmata (q), which has not yet come to my hands, I mean one of the celebrated Weiffius; so I do not doubt but if any one were to write at this time, "of the relics of the small-pox," he would not; as Georgius Francus (r), a man in other respects very learned, did formerly, on the same subject; omit the consideration of the separation of the epiphyses, which does not happen very rarely.

Yet nobody saw a greater number of epiphyses separated from the bones, in one season, from an internal cause, though of another nature, than Poupert (s), in that multitude of scorbutic patients, which crowded into the hospital at Paris, in the year 1699. For by reason of this disjunction it happen'd, that, if these patients were mov'd, the bones, and their epiphyses, were heard to rub against each other. Which observation is one of those, otherwise very few, observations, that are wanting in the medical treatise of the celebrated Hertius, *de Crepitu Ossium*; for he has diligently collected whatever else is extant in authors upon this subject, interspersing the observations of his father also now and then: although we want the light of dissections in determining the cause of this disorder, as happens in most persons.

But if we attend to the question, it seems that this cause ought more frequently to be plac'd, agreeably to the opinion of Hertius, in a kind of exciccation, than a moisture and laxity.

Nor did it seem otherwise to me, when you consulted me for a matron of the first rank, who, at the end of her fifth time of child-bearing, began to perceive a kind of troublesome crackling of the bones in her knees, while she turn'd herself from one side to the other; and sometime after that in all the joints of both her upper limbs: yet in such a manner, that it was the most troublesome in her knees, in consequence of being join'd with a considerable pain in the extension of her legs.

For how could I deduce from laxity alone, that which was join'd with pain. As I therefore had recommended such remedies, both internally and externally, as would moderately moisten and relax tension; in the following year, when she consulted me again, there were no longer any complaints of that crackling of the bones, no more than if they had never existed; but as she had been wont before that, to be subject to very considerable hypochondriac affections, she complain'd of these only.

35. Whether the vertebræ are most easily broken, or luxated, is a controversy among the most eminent men, which I have taken notice of in a former letter (t). And, in regard to the uppermost of them, why; though I formerly did not want frequent opportunities of examining into this circumstance, in the bodies of hang'd persons; I did not examine into it, I have said in the same place.

(q) Vid. adnot. ab Hallero ad c. 4. P. 13.
Meth. Stud. Medic. Boerhaav.

(r) Eph. N. C. Dec. 3. A. 4. Obs. 1.

(s) Mem. de l'Acad. R. des Sc. A. 1699.

(t) Epist. 19. n. 14.

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Since that time I have not had the opportunity. And in regard to the other vertebræ, though Valsalva and I have both of us inspected them, after the most violent blows, neither of us have found them luxated; but both have found them broken: as you have already learn'd from the fifty-fourth (*u*) and fifty-second (*x*) letters. Yet if two observations, on a subject like this, seem to you too few; add to them three of the celebrated Tabarranus (*y*); who, with his usual skill and diligence, has not only examin'd other things, but this in particular.

This author did not always find the vertebræ mov'd from their places: and when he found them mov'd at all, he did not see them to be so much mov'd from their places in general, as to allow him to believe they were luxated; but he always found them broken. Nor do I suppose that you will here propose to me the observations of our Vesslingius (*z*) and Pujati (*a*).

I very well remember that the former of these authors had seen some of the vertebræ of the back mov'd outwards, in a slight degree, in a certain woman, a native of Dalmatia; and in a man, a native of Padua, all the vertebræ of the loins remarkably inclin'd outwards, with a stupor of the inferior parts. So I also remember that the excellent Pujati had seen in others, and, what I bore with great displeasure, on account of the affection which I justly entertain'd for him, in himself also, the superior lumbar vertebræ prolaps'd outwardly; and not without torpors of the legs.

Yet I remember, at the same time, that both of them had ascrib'd those subluxations to internal causes, vitiating the ligaments. But the discourse that I have undertaken relates to those luxations which are said to happen from external violence, when the body and the ligaments are in a natural and healthy state: which I do not take upon me to deny; although, as particularly in the case of the celebrated Targioni (*b*), in whatever manner you endeavour to conceive of it, the explication thereof is very difficult; but I do not very well know, whether it is demonstrated by the dissection of dead bodies, that these luxations happen without a fracture of the vertebræ.

I have formerly read a history, which was said to be written by Bellini, of a mason, who, falling from an upper story of a house, and receiving a blow upon his loins, either in falling, or from the ground, began to lose the sense of feeling in his feet, and to discharge the contents of the intestines and bladder involuntarily, and to have the other symptoms that are describ'd.

As this man died after four days, the three uppermost vertebræ of the loins were found to be so luxated, as to be prominent a finger's breadth into the cavity of the belly; and therefore to compress the large trunks of the vessels in such a manner, as to bring their opposite parietes into mutual contact: from which it happen'd, among other things, that all the veins, from both the extremities of the feet quite to the luxation, were turgid with blood, and hard, just as if they had been stuff'd up by force.

(*u*) n. 26.

(*x*) n. 34.

(*y*) *Obierv. Anat. post* n. 7.

(*z*) *Epist.* 25.

(*a*) *Dec. Medic. Obs.* 6. n. 10. & seqq.

(*b*) *Semilussaz. delle vertebre lombari nella*
I. *Raccolta d' Osservaz. Med.*

In this case who can doubt of the luxation of the vertebræ? We would rather doubt whether the external force, which could overcome the ligaments, had not broken the vertebræ? and whether this had not, perhaps, by breaking them, been equally injurious to the spinal marrow, and its appendix, with the luxation itself? But of these things, that is of inspecting the vertebræ with attention, and the medulla itself, among so many other circumstances that are describ'd, not the least mention is made.

Thus in the fourth book of the Sepulchretum, and in the third section of that book (c), an observation of Fontanus is extant (for the observation of Panarolus, of luxations, which is in this sixth section (d), relates to the superior vertebræ; nor is it sufficiently certain, as I have said elsewhere, whether the luxation was without a fracture; and even, as I shall show just now, whether it was a true luxation), in which observation of Fontanus, we read, indeed, that a porter who had fallen from a high place, with his back upon a piece of timber that lay beneath, had "dislocated and loosen'd" the *vertebræ dorfi*; in consequence of which his body was curv'd. and his face turn'd towards the ground as long as he liv'd.

But when his body was examin'd after death by dissection, and particularly his back, instead of knowing, as you would expect, whether those vertebræ were broken, or not, you are told nothing about this, but only that five vertebræ were seen to be "conglobated into a gypsum," the viscid matter which adher'd to them "being converted thereto by a kind of natural inspissating heat."

Nor do I know that there are other dissections in the Sepulchretum, besides these, that relate to the present subject: you now see therefore, whether it is with reason we wish that the question had been more frequently and diligently enquir'd into by our predecessors.

That observation of Fontanus may, at least, give room for a suspicion, whether those, or whether other vertebræ, may not be prominent sometimes; not from a luxation, but from a matter, which an external or internal cause may produce around them, and indurate; from whence not only the nerves, that arise therefrom, are press'd upon, but the adjacent muscles which are destin'd to the extension, or flexion, of the body, and even the vertebræ themselves, are impeded and disturb'd in their actions and uses.

And in proportion as the nerves shall be less hurt, or the life of the man protracted to a greater length of time, the greater room will be given for this suspicion, or any other of that kind: which, especially in an unusual affair, Panarolus ought to have remov'd, when he spoke of the second vertebra of the neck being luxated, and that "by a very great luxation" too; and nevertheless said that the man "had liv'd in this manner for a great number of days:" for it was not enough to say that this "was observ'd from the dissection of the dead body;" but it ought to have been added, with accuracy, to what side the vertebra was luxated; and whether he had not found some of the ligaments, at least, to be ruptur'd from that violent fall, if not the vertebræ itself; or its dentoid process broken.

(c) Obs. 28. §. 1.

(d) Obs. 1. §. 1.

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But, on the contrary, I commend the most excellent Trew (*e*), who, having said that he had seen the first vertebra of the loins “ a little luxated ” in a man, has not fail’d to say, that the body of the same vertebra “ was divided quite through by a longitudinal fracture : ” and has asserted that, in another man, “ the body of the left vertebra but one, of the back, ” was found, by him, “ to be entirely pull’d away from its cartilage, at its conjunction with the last ; and not only this, but also that it was ground into several little pieces at the same place.”

And I could wish that others, when they met with the fifth vertebra colli luxated to the left side, and the sixth to the right side, a great aperture being interpos’d betwixt both (*f*) ; or when they found the second vertebra of the neck “ dislocated, ” though not so much in a boy of seven years of age (*g*), as in a soldier (*h*) ; had taken time to enquire, accurately, whether there was any part broken in those vertebræ, but particularly in the second ; and what part ; or whether there was any rupture in the ligaments.

In saying of which I do not call into question the veracity either of Panarolus, or of any other person : I only require diligence when there is opportunity ; and even expect it (*i*) from those who shall happen to light on such cases for the future.

36. But as to what I have said of the motion of the muscles which extend or bend the vertebræ, or of the vertebræ themselves being impeded ; this is common to other bones that are join’d together by a moveable joint. For as to what relates to the muscles, you might have seen from our observation above (*k*), that the leg, for instance, was inflexible, by reason of too strong an action of the muscles which extended it ; whereby the action of the flexor muscles was impeded.

And, on the other hand, you will perceive, from the observation and monitum of Caspar Hoffmann (*l*), that the leg sometimes cannot be extended, in consequence of being prevented by the opposite muscles ; which, by reason of the negligence of the surgeons, and their very streight bandages, are at length dried up, in the ham, into a hard knot. And that, when the muscles are not impeded in their action, the motion of the bones themselves is impeded for this reason, that though they should be no more than one in number, they are become one ; you have examples in this sixth section of the Sepulchretum (*m*) : and not only in the knee, but also in the elbow ; and even in all the joints of the body of an old man, from the head quite to the extremities of the toes.

In this old man the vertebræ had coalesc’d with each other, as well as the rest of the bones ; but in other old men, this coalition was peculiar to the vertebræ, from the observation of Paawius (*n*). So, long before him, it had

(*e*) Aët. N. C. Tom. 2. Obs. 51.

(*f*) Commenc. Litter. A. 1738. Hebd.

40. II.

(*g*) A. 1734. Hebd. 11. post n. 6.

(*h*) A. 1740. Hebd. 52. n. 3.

(*i*) Vid. infra, n. 37.

(*k*) n. 26.

(*l*) Comment. in Gal. de Usu Part. in fin.

I. 3.

(*m*) Obs. 3. §. 3. & Obs. 4. §. 3. & 2.

(*n*) Ibid. §. 1.

been seen in the vertebræ of the loins, in particular, by Cattus (*o*): and our Falloppius (*p*) has said, that the vertebræ, “which produce a gibbosity, are “so connected together in process of time, as to become quite one vertebra, “and leave no trace of any joint.”

But I do not so much wonder, that those observations have not been added to the Sepulchretum, as that the more surprizing, and more known, observations of Ruysch (*q*) have not been added: for Ruysch not only observ'd the same thing in gibbous bodies, but this also “many times;” that the bodies of the vertebræ, which had been curv'd forwards, were so compacted into one substance, that some of these bodies seem'd to have been annihilated; and sometimes four, or seven, bodies of this kind of vertebræ made into one bone, so as scarcely to equal the body of one vertebra.

After these, I purposely omit other observations, especially those that I have referr'd to elsewhere (*r*), together with those of Ruysch, though in a brief manner, of the vertebræ being join'd into one, both from the ancients and moderns; not to speak of my own, as I saw five vertebræ lumborum join'd together thus, that were found in the burying-ground of this hospital, and preserv'd by our Mediavia. For I suppose that what has been hitherto said of fractures of the bones, luxations, and other disorders injurious to motion, will seem to you to be quite sufficient. Farewel.

37. Thus far had I written, when, among the many dissertations which that illustrious man Albertus Haller lately sent to me with great kindness, and according to his custom, I read, with great pleasure, one relating to what I have just now touch'd upon in regard to the luxation of the vertebræ, publish'd at Tubingen by the celebrated professor Mauchart, in the year 1747.

In this dissertation, that very ingenious man inquires into the luxation of the neck; and, in the first place (*s*), says, that there was “not even the “shadow of a luxation,” in the vertebræ of the neck of any one of all the bodies which he had dissected, after their being publicly hang'd, notwithstanding the executioners had very violently, and for a long time together, press'd their heads forwards: and he declares below (*t*); which I would have you compare with what we have said in the nineteenth letter (*u*); that in two young men, one of whom he dissected, and the other the celebrated professor Weissius, that the muscles had been lacerated by the halter; in the first, the sterno-thyroidæi, not to mention the sterno-hyoidæi; and, in the second, these and the sterno-mastoidæi; and, in the same body, that the cricoid cartilage was broken into many little pieces; and the trunk of the aspera arteria entirely torn away from the larynx.

But as to what relates to other external violences; as, for instance, to blows, falls, and such-like accidents; he denies that there is extant any certain and accurate observation of a luxation of the first vertebra, from the

(*o*) Isagog. Anat. c. 3.

(*p*) Præfat. ad Tract. de Lux. & Fract. Ossib.

(*q*) Obs. Anat. Chir. 67.

(*r*) Epist. 27. n. 32.

(*s*) § 5.

(*t*) § 16.

(*u*) N. 8. & 13.

(*x*) § 9. & 11.

head, as far as he knew: though he had turn'd over more than fifty celebrated writers of surgery, and chirurgical observations.

And of the receding of the second vertebra from the first, and of the fourth from the fifth, he produces, in all, two examples (*y*), which well deserve reading; as many monita also do, that relate to luxations of these vertebræ; as, for instance, that they are deceiv'd (*z*), who do not doubt but the second vertebra is luxated from the first, when the point of the finger may be inserted betwixt both; as if, in fact, this could not happen naturally: and that so much the more, if the ligaments, which lie betwixt, have suffer'd any considerable violence in extension: and, in like manner (*a*), that the second vertebra cannot be luxated forwards, unless by a surprisingly great, and almost incredible impetus, the very strong ligaments of the dentoid process be ruptur'd, or the process itself broken.

I omit other things: for you very well perceive, even from what has been already said, whether it is with justice that I have complain'd (*b*) of many things being omitted by Panarolus, in his description of a luxation of the same vertebra.

And, certainly, if you suppose that the first vertebra cannot be luxated from the head; it must, of course, be an obstacle to the tooth-like process of the second vertebra, either by its anterior bony arch, which prevents it from being carried forwards, or by its very firm transverse ligament, which prevents it from being carried backwards, with the second vertebra when impell'd, so that this vertebra shall be luxated; unless either the ligaments are ruptur'd, or the dentoid process itself broken: and you see it will happen nearly in the same manner, when you observe what lies in the way of the tooth-like process laterally, if you should chuse to suppose this vertebra to be luxated to either side.

For my discourse was of true luxations of this kind. Of which kind I could wish that they had been in the two examples of Mauchart: for although he says, that he could introduce his thumb betwixt vertebra and vertebra; yet, in the first, he even expressly denies (*c*) that there was "a true luxation." And I even wish that the first example had been from his own observation, and not from the observation of a certain neighbouring physician; for in that case mention would have been made of the ligaments being ruptur'd, or of the bone being fractur'd, or not fractur'd: which deficiency is not in the second; yet if, instead of being merely present, he had perform'd the dissection in this, there would have been no doubt whether the ligaments had been lacerated by the violence of the fall, or by the knife: and the vertebræ being examin'd very accurately, both internally and externally, it would have been now much more certain, that there was no fracture of the bones.

For which reason it is to be wish'd, from him in particular; both in regard to those vertebræ, and all of them; that according to the occasions which may present themselves for the future, this controversy may be totally deter-

(*y*) § 11. & 12.

(*z*) 15.

(*a*) § 10.

(*b*) Supra, n. 35.

(*c*) § 16. in fin.

min'd; and the anatomical doctrine of the ligaments may at the same time be completed; wherein, not only I have observ'd that some things still remain to be treated of, more accurately, after Weitbrecht; but Mauchart, by that peculiar skill and accuracy which he is remarkable for in dissection, really shews, in the dissertation entitled "The Articulation of the Head with the first and second vertebra."

And these few things I was willing to say, by way of postscript to this letter; left, because the copies of that other dissertation, subsequent to what I just now mention'd, are very scarce in Italy, you should be ignorant what so great a man has thought, or seen, in regard to the luxation of the upper vertebræ. Once more farewell.

LETTER the FIFTY-SEVENTH

Treats of the Gout, and other Pains of the Joints.

I HOPE you will not be greatly surpriz'd at my not treating, here, of the impediments to lying down on the back, or the sides; and producing very few observations that relate to the gout; when you have consider'd the two next sections of the Sepulchretum, and the thing itself. For as to patients not being able to lie in a supine posture, or on their sides; this generally happens from diseases, on which you have often receiv'd other letters from me, that take no less notice of the troublesome symptoms, or inconveniencies, wherewith those diseases are join'd, than of the diseases themselves.

For this reason, the seventh section also, that is allotted to the treating of these impediments, in the Sepulchretum, is very short: not because histories are wanting which relate to the subject, but because almost all of them, having been already produc'd, each in its proper place, are refer'd to here in three words, by pointing out the place where they may be read at pleasure; in the same manner as the sixteenth, the twentieth, the twenty-first, the twenty-second, and the thirty-eighth letters, may be pointed out to you by me, in preference to other letters.

As the gout is generally a disorder of the rich, and very seldom of the poor; and the carcases of the latter, not of the former, are deliver'd to anatomists; or as, if at any time the bodies of the rich are to be open'd, the viscera only are subjected to examination, for the most part, and scarcely ever the limbs; it happens from hence, that observations which properly relate

relate to the gout, are far more rare in the books of anatomists, than those of a great number of other diseases.

For this reason it is, that but few could be transferr'd into this eighth section of the Sepulchretum, that treats of the gout; which section, therefore, is, for the most part, made up of scholia: and out of those few observations which it does contain, some had been already produc'd in the preceding books; and you will find, that the last which is added had been already propos'd by Bonetus himself a little before, in that same section; and what is still more, even in the immediately-foregoing page; and in so many words; if you compare it with the eleventh observation, and its scholium.

I, however, am still resolv'd to repeat no history, though I might take occasion to repeat many from Valsalva's, and from my own. When it becomes necessary to bring back to your memory any of these observations, I will point out the letters in which you may read them. Here you will have very few indeed; but then they will be what I have not sent you on any former occasion.

2. A woman was frequently afflicted with ischiadic pains, at the joint of the femur, on the right side; on which side she was lame, and somewhat gibbous. At length, she was first seiz'd with a palsy, and after that with an apoplexy; which carried her off before the end of January, in the year 1741, at the time I was reading anatomy in the college: to which place the body was carried from the hospital.

The belly being open'd, the omentum appear'd to be stretch'd down almost to the pubes. And in attempting to turn this up, we turn'd up, at the same time, the intestine colon, which was curv'd towards the lower part of the belly, and adher'd closely to the omentum. That is to say, the seat of this intestine was different from what it generally is. For, besides that the beginning of it, as well as the cæcum, was lower in the belly than it generally is; when it had ascended from that beginning, almost quite to the liver, it was reflected downwards from thence, into the upper part of the hypogastrium, in the form of an arch; and ascended upwards from hence, very high, by a curvature quite similar, into the left hypochondrium: and in the whole of this arch, as has been already said, it was firmly tied to the omentum.

Both of the Falloppian tubes were shut up at their uterine orifices. The osculum uteri was not surrounded by any corona on the back part. The vagina was short. The space from the glans clitoridis, also, to the orifice of the urethra, was short; so as not to be equal to the breadth of a little finger. The trunk of the great artery, which is in the belly, sent out the superior mesenteric artery of a larger size than the celiac: and was distinguish'd in several places internally by whitish spots. The other vessels we did not examine; these parts being replac'd by better from other bodies; and we fearing lest our confinement, as to time, should prevent us from examining the head.

I have already told you, on a former occasion (a), what kind of thyroid

gland I met with in going on to the muscles of the neck, the remaining part of the trunk, and the limbs: and what kind of joint of the right os femoris, with the acetabulum, I found, I must now tell you; agreeably to my promise in the preceding letter (*b*); only first making this remark, that the bony sinus, wherein the right scapula receiv'd the head of the os humeri, had its edge manifestly deficient, where it should have approach'd, with its anterior side, to the upper part.

The head of the right os femoris was not rounded into a globular form: and was depress'd, and not cover'd by a smooth and white cartilage, but by one of a pale ash-colour: and, indeed, this cartilage was totally deficient in the posterior part of the head; so that the bone appear'd naked in that part, and form'd into many roundish and protuberant particles.

The internal surface of the acetabulum was bloody: and the supercilium thereof, as it is call'd, had two bony laminæ buried within its natural cartilaginous and ligamentous substance; which laminæ were not small, and lay near to each other.

3. Fernelius (*c*), indeed, judg'd that an arthritic humour "never, or very seldom," penetrates into the cavity of the joints, but only falls upon the surrounding ligaments, membranes, and tendons; making use of this argument, amongst others, that in the tophaceous podagra, or chiragra, the humour, which is already concreted into a calculus, is, for the most part, taken out from the joints of the fingers, or toes, the capsular "ligament" being sound and unhurt."

But others, afterwards, as you will learn from the Sepulchretum (*d*), seem to have attempted something more than Fernelius; since they endeavour to prove, that even the tendons, which are inserted into the joints, have either "no sensation at all, or a very obscure one:" and that this gypseous matter is indeed, at length, collected near the joints, by reason of other additional causes, but not always; as it is met with in other neighbouring parts. In the woman in question, however, who was so tortur'd with ischiadic pains, I found no disorder near the joint; but all of it within the joint.

Yet we do not deny that this tartareous matter concretes, also, near to the joints; as in that priest in whom Valsalva (*e*) found it immediately under the skin, in the membrane that enwraps the tendons of the fingers. Nor shall I make any objection, if they should chuse to understand the words of Aretæus (*f*) in the same manner: "In the joints, also, tophaceous bodies are form'd: in the beginning they appear like abscesses: but afterwards they are more inspissated, and when the humour is concreted, it is even difficult to bend the joint: at length, they become white and solid tophi."

And I will even refer you to the observations of our Sanctorius (*g*). His words are as follow: "I have sometimes seen, that in a certain old knee-gout, a gypseous pituita, similar to a liquid lime, had flow'd down to the skin; upon the perforation of which it was discharg'd in that liquid state:

(*b*) Epist. 56. n. 16.

(*c*) Patholog. l. 6. c. 18.

(*d*) Sect. hæc 8. in Schol. ad Obs. 1.

(*e*) Epist. 40. n. 2.

(*f*) De sign. & caus. diuturn. morb. l. 2. c. 12.

(*g*) Comment. in 1. F. 1. l. Can. Avic. D. 4. c. 1. t. 1.

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“ stirr’d up by which experiment, I once made use, in the case of a knee-gout from a gypseous pituita, of the dripping of water from unwash’d wool, in which mallows, cresses, and other herbs of the emollient kind, had been boil’d; and, after a long interval, I made some portion of that gypseous pituita, which lay under the skin, liquid and soft; and evacuated it from thence, by cutting into the skin.”

This curative experiment I was not willing to omit here; although it did not escape me (*b*), that the calcarious matter of gouty joints had been “ solv’d by warm water alone,” but when taken out of the body, as I suppose; and that from thence hopes were conceiv’d, that by means of frequent draughts of lime-water, to which soap is added, it would happen that this matter should be dissolv’d in the very joints of gouty bodies: and I could wish this hope might have been more just, if the success could prove, that as great a quantity of this water was carried into the joints, as was carried into the bladder.

We therefore grant to those, whom we have referr’d to in the Sepulchretum, that near the joints also, and that not uncommonly, a tophaceous matter is collected. And I moreover even add, that it is sometimes collected far from the joints; as we have seen in a tumour of the breast of a gentleman (*i*), whose grandfather and father had been afflicted much with the gout, he himself not having been wholly free therefrom.

But we cannot, for this reason also, approve what they assert: that as the capsular ligaments shut up the cavities of the joints, and as “ no passage lies open ” thereto, nor any vein enters these places, the gouty humour cannot be carried within them. For there is the same passage, into these cavities, for this humour, as for the mucilage that lubricates the cavities: and that the glands which secrete this humour, are furnish’d with their little arteries, is not only demonstrated by reason, or injections; but even by the eyes themselves, when unfurnish’d with glasses, and looking upon those reddish and slender flaps of these glands. Wherefore, when the blood is loaded with tartareous particles, these particles may be deposited in the cavities of the joints, by means of these same vessels, together with the mucilage; as well as by means of other arteries about the tendons, and membranes, which lie adjacent to the joints.

And these particles concreting into tophi, and little stones, by gradually drawing asunder the bones, and by dissolving the ligaments, “ break the joints,” as Persius (*k*) says of “ the stony chiragra;” or as Cælius Aurelianus (*l*) says of these gouty “ stones, they loosen the joints, and distend the skin, and by bursting forth become prominent, and are taken out by the hands of the surgeon:” all which circumstances I have seen, and particularly in the joints of the fingers of a certain Venetian nobleman.

Nor will you have any room left to doubt, whether they are really form’d within the very cavities of the joints, when you read the observations re-

(*b*) Vid. § 11. Dissert. cit. Epist. 42.
n. 19.

(*i*) Epist. 50. n. 45, 46.

(*k*) Sat. 5. v. 59.

(*l*) Morb. Chron. l. 5. c. 2.

counted in the Sepulchretum, from Harderus (*m*), Schneider (*n*), and Dobrzensky (*o*).

4. Yet it is not always necessary, that the tartareous particles should enter the cavities of the joints, together with the mucilage, in order that arthritic affections may be there produc'd. It is sufficient, if you attend to Boerhaave (*p*) on this head, that the mucilage itself, if not attenuated by a proper attrition, and for that reason not absorb'd, " stagnates a considerable time" in the joints, " and becomes acrid by this very stagnation." For by this means it produces the most violent pains: and " frequently these very great " disorders arise merely from a sedentary kind of life."

And to this other things ought to be added, which we reckon among the causes either of diminish'd attrition, or of difficult absorption, or of both; I mean moist cold, which injures the natural tone of the joints in a great degree, and that so much the more easily, because the cartilages and the ligaments, of which they are compos'd, and the tendons wherewith they are most of them cover'd, are not furnish'd with a great number of sanguiferous vessels, if compar'd with most other parts; and these vessels are certainly very small; for which reason it happens that they are more subject to cold; and especially in those joints which are very much expos'd to the injuries of the cold, as in the feet.

We must likewise add pressure; as, for instance, from tight shoes, from whence many of the resorbent vessels are either made too narrow, or quite obliterated: and this so much the more easily, as they are press'd against the very hard parts of which I have said that the joints consist.

Other causes are, the distance from the heart, from whence the impulse in propelling the humours is very languid: the easy and perpendicular passage through which the same humours are to be carried: the indulgence us'd during the pains of the affected parts, in which delicate patients remain even much longer than there is occasion: a lentescient and viscid state of the mucus, either from morbid causes, and in particular from gluttony, drinking, or venery, or from any parental taint; whereby the absorbing vessels are also streighten'd, and there is a weakness of the propelling fibres: and other circumstances of the like kind.

A great number of which I have enumerated, because I have observ'd that some persons in describing them from Hoffman (*q*), (in whose works almost all these circumstances are taken notice of) without making any mention of this author, have omitted some things that ought not to be pass'd over; whether we undertake to explain nothing else but what Hoffman has done, that is to say, why the feet are, more frequently than other parts, seiz'd with the gout; or even why, and that in the beginning also, some other part is seiz'd therewith.

For in fact; as is said by Cælius Aurelianus (*r*); " the arthritic pain " takes its beginning from the feet sometimes, and spreads to the other

(*m*) Sect. hac S. post. Obs. 2.

(*n*) Obs. 3.

(*o*) Obs. 5.

(*p*) Prælect. ad Inst. § 258.

(*q*) Medic. Rat. Tom. 4. P. 2. S. 2. c. 11. Thef. Pathol. § 16.

(*r*) c. 2. paulo ante cit.

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“ joints; and sometimes beginning in the other joints, attacks the feet afterwards.” And those joints which are not only in more frequent motion than others, but, at the same time, subject to fewer of those causes that I have enumerated, scarcely ever, or never, are seiz’d with the gout: nor do I remember ever to have heard, or read, that those joints were thus affected, whose obsolete memory I have endeavour’d to restore, by shewing that there was no part deficient in them, by reason of their smallness, that was given to the larger joints; for we have evidently demonstrated (*s*) those very small joints, that are interpos’d betwixt the cricoid and arytenoid cartilages, to be supplied with a membranous capsular ligament, with the flap of a mucilaginous gland, and with mucilage.

But those joints are chiefly affected by adventitious morbid causes, which are subject to most of those other causes that I have mention’d; I mean the joints of the feet: wherefore, when ancient authors (*t*) saw an epidemical gout, so that eunuchs also, women, boys, and girls, and flocks of goats, in like manner, were affected therewith; it was that foot-gout which attack’d the inhabitants of the place promiscuously, for twenty years together.

But it was less surprizing that two illustrious young men of fifteen years of age, who began to labour under the gout, should have been known to Brasavolus (*u*); as I myself have seen little children, who were seiz’d with severe pains of the joints, and greatly disorder’d thereby, before they had well got out of their infant-state: and have, at the same time, known that their father, grand-father, and great-grand-father, had been subject to the gout.

5. And how acrid the mucilage of the joints sometimes becomes, by stagnating in their cavities, is sufficiently argued, I think, from the bloody appearance of the acetabulum of the woman in question (*x*), and from the erosion of the head of the femur. But when the acrimony has come to this pitch, do you think it possible that the hip-gout may be cur’d by any internal or external remedy?

I certainly do not think it is: not even if you make use of “ the last and most efficacious remedy in inveterate disorders;” for thus, I believe, we ought to read the words of Celsus (*y*); “ by ulcerating the skin, in three or four places, upon the hip, by means of red-hot irons;” not to mention other and milder kinds of cauteries besides, that were us’d by Hippocrates (*z*), such, and many more, as are taken notice of by Cælius Aurelianus (*a*); among which is this also, that was likewise us’d by Hippocrates, and which seems, more than any other, to have corresponded to the *moxa* of the Indians, I mean a kind of fungus that was set fire to at the upper part: all which kinds of burning Cælius; although he acknowledges them to be “ moderate by their gentle penetration;” nevertheless postpones to other remedies, on account of being attended with a great deal of uneasiness,

(*s*) *Advers. Anat.* 1. n. 15.

(*t*) *Vid. apud Donat. de Medic. Hist. Mir.*

1. 1. c. 8.

(*u*) *Vid. ibid.*

(*x*) n. 2,

(*y*) *De Medic.* 1. 4. c. 22. *Vid. Epist.* 6: *nostram in Cels.*

(*z*) *Vid. apud le Clerc. Hist. de la Medic.*

P. 1. l. 3. c. 28.

(*a*) *l. cit.* 5. c. 1:

and forbidding the use of those remedies, “ as the ulcerated parts cannot bear the application of them.”

But burning, in order to contract and corroborate relax'd parts, has its use; and ulceration of the skin, in order to carry off, and eliminate, from the internal parts of the body, some portion of the morbid matter which has fallen thereupon, has its use also: wherefore you will not think a mild burning of this kind, and timely applied, a remedy entirely to be rejected in some cases; especially when you call to mind, not only the cures of the ancients, but also some more modern cures, that have been successfully perform'd thereby.

You will think much the same of some other remedies. “ So great,” says Arantius (*b*), “ is the efficacy of glysters, in the hip-gout, especially “ when incipient, that I have restor'd many, who were grievously affected “ therewith, to their former health, without the application of any other remedy besides these.” And the first glysters which he proposes you will, without doubt, readily approve, as they do not greatly differ from those that Cælius (*c*), who has been so often mention'd by us, recommends; “ whereby “ the internal parts, being fomented and moisten'd with vapour, consent in “ a universal relaxation.”

But where those first glysters have not been sufficient, Arantius prescribes another kind, and that, as he himself acknowledges, a strong purging clyster. Will you then reject them all entirely through fear of irritation? Nay, where there are those causes and those bodies that he supposes, you will make use of some other kind of glyster, if you do not make use of that, whereby to obtain the same purpose.

And certainly, if you read the more ancient, or more modern, physicians than Arantius, you will find that there are many testimonies which agree with his. Thus Montagnana (*d*) says, that ischiadic pains, “ by the testimony of all prudent physicians, are cur'd by acrid glysters.” And Riverius (*e*), after other clysters being frequently applied, at length proposes acrid ones also; so that you may perceive him to be very manifestly of the same opinion with Arantius.

Moreover Etmuller (*f*); to omit others; not only says that clysters are suitable, and particularly when repeated; but adds this: “ and it is necessary that they should be acrid.” Who then dare suspect, that what so many very experienc'd professors so greatly recommend, has not answer'd sometimes with them? This remedy therefore has sometimes its use.

But at other times there is room for those glysters which Cælius approv'd, or others that act in a different manner; among which I know that those have sometimes been of advantage, that have been prepar'd from water wherein the *os perneæ* had been boil'd: even more than glysters made up of elaborate pharmaceutical preparations, not to say of preparations equally cheap.

(*b*) l. de Tumor. p. n. c. 1. p. 63.

(*c*) c. 1. cit.

(*e*) Consil. 257.

(*e*) Prax. Medic. l. 16. c. 2.

(*f*) Prax. l. 2. S. 2. c. 3. art. 8.

Yet I should suppose that some of them were compos'd of such things as were useful to the nerves, that lie near to the intestinum rectum; which, descending behind the os ischium, some consider'd as the seat of the ischiadic pain: especially from the time Coiterus (*g*) had said, that, he had found the space betwixt the lower part of the spinal marrow, and its dura mater, through which those nerves are carried, to be "frequently fill'd with a thin serum, in arthritic, ischiadic, and podagric patients; and sometimes with a viscid pituita." And this observation is transferr'd into the Sepulchretum (*h*), though not quite in the words of Arnisæus, who takes notice of it; yet this I am the more careless about, because a fluid of the same kind is found in those also, who have not labour'd under a disorder of this nature.

6. And I must think the same of purging medicines, and of blood-letting, as I have thought of glysters. For as to what relates to blood-letting, to say nothing of the opinion of those, we suppose that the ischiadic gout is from a vain effort of nature, in attempting to expel the superfluous blood, by the way of the hæmorrhoidal vessels; certainly the more ancient authors have led the way to the observations of those persons: among which more ancient authors is Joannes Zecchius (*i*), who has said, in dependance upon reason and experience, that blood taken from those veins "is, in a surprizing manner, serviceable to ischiadic patients."

The same author relates still more surprizing things of the very speedy solution of this disorder, if the vein which lies upon the external ankle, on the same side, be open'd: and this is confirm'd by an almost similar observation of Riverius (*k*). Who will deny that these authors had seen what they say they had seen? But would you attempt that in a very weak constitution, and one that has but little blood, which it is natural to suppose had succeeded with them in a robust and full habit; or in one that had become ischiadic from a suppression of the hæmorrhoidal flux?

I also know that you would not give purging medicines to an arthritic patient whose body is extenuated, and strength decreas'd; or whose nerves may be easily drawn into consent: or, finally, to one whose stomach is of such a nature, as easily to be injur'd therefrom.

Yet I do not suppose you therefore think, that every purging medicine is, at all times, and in all constitutions, injurious. For if this were the case, most of the more ancient physicians would never have prevented, or got rid of, the gout, even when it was incipient; as they assert that they had gain'd both these points, by the use of purging medicines in particular.

I am prevented from mentioning each of them separately, by their follower, Demetrius Pepagomenus, physician to Michael Palæologus; who, by the command of his master, wrote a little book on the gout, which has been printed at Padua in my memory, as the work "of an uncertain author," and not to be had separately from large volumes: whereas; to say nothing of the more ancient edition; it had been publish'd separately at Paris, in the year 1558, and not without the name of the true author; as also at

(*g*) Observ. Anat.

(*h*) Sect. hac 8. Obs. 6.

(*i*) Consult. Med. 43.

(*k*) Cent. 2. Obs. Med. 25.

St. Omers, in the year 1619, Joannes Bergesius publisher; who, I suppose, would not have given himself the trouble to turn the French version of Jamot into Latin, if he had not been ignorant of its being publish'd in Greek and Latin at Paris, and of its being elegantly translated into Latin by Marcus Musurus.

If you therefore turn over this book, even hastily, you will immediately see how much this Greek physician, as a follower of those ancient Greek physicians, attributed to purging remedies, in curing, and preventing, the gout.

But lest you should imagine this to have succeeded in the country of Greece only, and object to me that a physician of great note, in our time, asserts every kind of purging, even "by means of lenient medicines;" not to speak of stronger remedies; to be for the most part injurious to gouty patients; whether you mean to cure the present paroxysm, or prevent a future one: and that even he had found it, by experiments made upon himself, as well as upon others, so little to answer his wishes, "that it invited" and increas'd the very evil which it was expected to prevent, and to cure;" lest then, I say, you should object these things to me; I will oppose to you two physicians among our countrymen, who were very famous when living; who were themselves gouty, and had tried purging on themselves; I mean Marcus Gatinaria and Petrus Bayrus.

The former of these gentlemen (*l*) having made use of evacuation every month, for the space of two years, and made use of reduction by abstinence twice a week, says, by these means "I certainly was cur'd, and have never" been afflicted with the gout since." And Bayrus (*m*) having already labour'd eight or ten times under the most violent pains in all his joints, so as not to be capable of moving any other part besides his tongue; and being again afflicted therewith; could, upon taking his own electuarius caryocostinum, walk on the same day, and the day after was free from disorder: and this experiment he made twice afterwards with the same success.

And in fine, after having made use of the same medicine three or four times a year, whenever he began to perceive any signs of plenitude, he says, "it is now more than six-and-twenty years since I have been at all troubled" with these pains; and this experiment I have made not only upon myself, "but upon a very great number of patients; and that with the same success;" and this electuary, of which he speaks, is the same that our Capivacci (*n*) said "deserv'd the highest commendations," in the gout, "as" had often been prov'd by experiment."

I have spoken thus at large of Bayrus, lest you should say, that the purgings, made use of by Gatinaria, had succeeded so well, because he began just then to be troubled with the gout; and besides, through the whole space of two years, drank little or no wine: although I know a learned man who, being troubled very much, and for a long time, as his brother was also, with the gout; and having tried all other things, and amongst these water-drinking,

(*l*) Vid. apud Donat. c. 8. supra ad n. 4. cit.

(*m*) De medend. hum. corp. malis Enchir. Dist. 19. tr. 1. c. 1.

(*n*) Consil. Medic. a Scholz. edit. 232.

instead of wine, for a year together; gain'd not the least advantage thereby, and even became weak and emaciated, till he began to make use, every day, before his sparing supper, of one of the *Pilulæ Melanogogæ Langelotti*: by means of which pills he had stools that were, for the most part, mucous, but not in great quantity.

For, by these means beginning to be better, he went out from home: and I saw him afterwards walking firmly, and expeditiously, without any staff or support; being of his former habit of body, and in good health; at which time he took one of those pills only every fifth day.

Nor is it to be doubted, but the most modern writers in medicine, would, if they had not well-known instances of this kind, have, themselves also, forbid every kind of purging to gouty patients: and indeed they do not approve very violent medicines of this kind, especially in the paroxysm; but they recommend the more mild purgers, when the paroxysm is at hand, and even when it is incipient; and still more to prevent other paroxysms.

7. In regard to the milk-diet also, as it is call'd, it is certain that we ought to consider of it again and again, before we prescribe it to arthritic patients; lest it should happen to be injurious to an impure body, or one that is liable to hypochondriac affections: or should be of more detriment than utility to a weak stomach. And, indeed, the most eminent physicians have asserted, that this utility is very precarious, and of short continuance; even in those who bear milk well: and that soon as ever the milk-diet is omitted, and they return to the diet of healthy persons, although mild and gentle, the gout returns, and troubles them far worse than before; or that, in the stead of it, the most violent internal disorders come on, which are soon after follow'd by death.

However, neither every kind of milk, nor milk taken in every way, of course leaves these inconveniences behind it; as, for instance, if it be given to those with whom it agrees: and not milk only, but other proper foods also; nor too great a quantity of these foods be given at the same time; in the same manner as we do, not uncommonly, in other disorders.

At least, among the observations which Daniel Puerarius, as I suppose, added to the observations of Thomas Burnet (*o*), there is one of a count, who, when his stomach was not able to bear the farther use of milk, liv'd upon puddings made with milk and sugar, and chickens fed with bread soak'd in milk; by which means returning to his former method of living, he was, indeed, subject to very slight pains of the joints, and such as could be easily got rid of, but not to such as he had been formerly troubled with.

And "not a few" other persons of gouty habits, having taken milk about the space of two years, "indulg'd themselves afterwards in drinking "freely of wine without any disadvantage." Thus far he. But Cornelius Celsus (*p*) has deliver'd down to us in his writings, "that some gouty patients, having cleans'd themselves universally, by the use of asses-milk, "had escap'd this disorder for ever."

And Pliny (*q*) has confirm'd this by saying, "There are examples of those who have been freed from the hand-gout, or the foot-gout, by drinking asses-milk." Which passage, I see, is copied in the annotations to the *Consilia* of Ballonius (*r*), not without a remark, how a easy remedy of this kind, and one proper to correct the acrimony of the arthritic serum, should be omitted by the physicians of that time.

And when different things were objected by different persons to those who, after that, renew'd the Hippocratic use of milk against this disorder; Lodovico Testi arose, an excellent old man, and an intimate friend of mine, who found out a method of using milk that was liable to less difficulties; by inventing the sugar of milk, as he call'd it. The successful effects of which were prov'd by many persons, both among our countrymen and foreigners; yet when the author was dead, the use of his invention seem'd, I know not how, to decrease.

8. But do not expect that I treat of quicksilver in like manner, the use of which, so as to excite a salivation, has been recommended by some authors against this difficult disorder, among other remedies, as Etmuller (*s*) will shew you; though some in a different manner from others, among whom is the celebrated Pujati (*t*).

For I will not speak of this remedy more particularly here, than of diaphoretics, and of the more bitter or heating herbs: not only to prevent prolixity, but also that I may say no more of these remedies than of others; I mean, that they may sometimes have their use; and that, at other times, they are not only useless, but even injurious; and especially the more violent kinds.

I therefore remember that, when a certain physician was relating to me, that he, by giving quicksilver to gouty patients, who were moreover affected with a lues venerea, having promoted a plentiful salivation, had driven away the lues indeed, but had not in the least diminish'd the cause of the gout, as they continu'd to be attack'd therewith no less violently than before; I remember, I say, to have answer'd, You have reason to be content that their fits have not been more violent.

And although in this disease, as well as in others; not to say more in this; we ought to use the fewest and mildest medicines we can; and though this is the plan I have always pursu'd; yet if, at any time, some peculiar causes require a remedy which we should otherwise avoid, we must give credit to Boerhaave (*u*), who writes, in regard to the gout, "that whatever remedy is most opposite to the cause from whence the disorder had its origin, this is, in every one, the greatest and best remedy;" especially where this seems to agree with the constitution of the body which we endeavour to cure. And hence it is, that some medicines which have been suspected by many physicians, have been of great use in this disease.

Thus; to speak a little of external medicines also; how useful in preventing and curing the pains of the joints, the oil from the roots of the

(*q*) Nat. Hist. l. 28. c. 9.

(*r*) L. 2. Conf. 3. Annot. 4.

(*s*) Prax. art. 8. supra ad n. 5. cit.

(*t*) Dissert. de Hydrarg. n. 51. & seqq. & in fin.

(*u*) Aphor. de cogn. & curand. morb. 1280.

cinnamon-tree has been, appears from the *Transactions*, as they are call'd, of the Royal Society of England (x). Thus, how many and various things, that have given ease to these pains, when externally applied, do we meet with in turning over the writings of physicians.

To speak only of fat; I remember that the fat of frogs, hedge-hogs, geese, wether-sheep, and dogs, have been recommended. I have also seen that of asses sometimes prescrib'd by Albertini, which you will find mention'd by Paullinus (y), and yet not for this purpose. Will you suppose, then, that because any one of these things has been sometimes of use to some persons, it must be suitable to all persons, and at all times?

It is certain, that Albertini applied the fat of asses, in a certain ischiadic man, who was neither affected with very great pain, nor inflammation. But, at other times, in order to assuage the pains of the joints, as far as it was proper, he made use of no other remedies than what most of us make a practice of using; yet, in every one of them, he chiefly made use of that wherewith every one us'd to be eas'd: as, for instance, a piece of fresh beef, chang'd twice a day; or, to take notice of a thing which I have nowhere read of, but was us'd to a senator of Bologna, with great advantage; a rag moisten'd with the juice press'd out from the leaves of elder, and slightly warm'd.

I know, indeed, that the flowers, or tender stalks, of elder, or even the leaves themselves, but join'd with other things, have been recommended by the Greek (z) and Latin (a) writers; yet the simple juice of the leaves I do not remember to have seen recommended.

9. But these external, and those internal remedies, likewise, whereof we have spoken; and others that are recommended by authors; whether they have been useful to any person, for the reason which was just now pointed out, or have been applied, by accident, near the decline of the disorder, which sometimes comes on much sooner, of itself, than it generally does; or even (which I would have you understand, in particular, of those medicines that are call'd preservatives) whether the health which is ascrib'd to their use, would be more justly ascrib'd to the exact method of living which is order'd to be observ'd, at the same time, for a long while (both of which circumstances Cælius Aurelianus (b) suspected also: and Celsus (c), and others, testify the second, even of itself, to have brought "a security from " the disorder, through the whole course of life"); this is certain, that most of them have either never been at all useful, or, at least, very little, to most persons: and that some of them have thrown patients into very great danger, or have brought on the cause of their death.

Therefore, if you compare all the circumstances I have taken notice of, with the disorder of that woman (d) whose history led us to these remarks; you will readily conceive how few things could have been of any use (for as to perfect health, after the bone was in part corroded and destroy'd, that

(x) Saggio delle Transaz. &c. Tom. 4.

(y) L. de Afino, S. 4. c. 3. § 12.

(z) Dioscorid. de Med. Mat. c. 168.

(a) Scribon. Comp. Medic. 160. Samonic. de Medic. c. 42. Marcell. de Medicam. c. 36.

(b) C. 2. supra ad n. 3. cit.

(c) C. 24. supra ad n. 8. cit.

(d) Supra, n. 2.

d not be expected); and, on the other hand, how many would, without doubt, have been very injurious.

Among these you will reckon those, also, that I have not yet mention'd, only had a view to; I mean, such things as repel the arthritic matter already deposited about the joints, or beginning to be deposited, force it towards the veins, and prevent it from being deposited, (then or afterwards) by astringing the small vessels that carry it to the joints, and unfeebly corroborating the fibres. For how much injury it may do when excluded therefrom, may be even conceiv'd from the utility which it very often brings with it, when admitted thereto.

See, for instance, how the disorders of the hearing with which a gentleman was troubled, and to which other remedies gave no relief, us'd to be entirely remov'd by the gout coming on; and return when the gout went off; as Reusnerus (e) remark'd: and how the wife of Gerbezius (f) was wont to have a severe pain, for a long time, in her breast and stomach, till she was immediately freed therefrom by the appearance of the gout.

But why do I seek examples from these, and other writers, (that could furnish one with so many) of the utility of this disorder, which I have experienc'd in myself. For when I was afflicted with that inflammation of both eyes, whereof I have formerly made mention (g), which now almost approach'd to a chemosis, and had made use of other remedies in vain; and I myself thought, and my friends confirm'd the opinion, that blood-letting should be delay'd no longer; it came into my mind to try, before I had a vein open'd; for I never had been bled, nor ever have been to this day, though I am now in my seventy-ninth year; to try, I say, whether bathing the feet with warm water, and using gentle frictions thereto, would be of any advantage.

And I had not done this for more than two evenings, before a pain, which came in the very joint of the right toe with the metatarsal bone, shew'd that the gout was at hand: and this pain, being increas'd slightly in the night-time, immediately diminish'd the inflammation of my eyes; and in a few days took it off.

This gout was very mild, as I had never had it before, and my parents and ancestors had not been subject thereto; nor did I feel any thing of it afterwards for five years, at the end of which period it appear'd in the left knee, but in a very slight degree; so that the effect of this pediluvium, in bringing on the gout, was similar to that in the young man whose history I see in the *Commercium Litterarium* (h), but the gout very dissimilar in its violence: nor is this to be wonder'd at: since he; to omit other things; did not make use of a milk-warm bath, as I did, but of one extremely hot.

However, in proportion as the gout is of advantage, when the joints afford a free admission to it; so much injury does it bring on the other parts, when the joints will no longer admit it. And though this might be confirm'd by innumerable observations, many of which you may see, if you please,

(e) Eph. N. C. Cent. 5. Obs. 8.

(f) Earund. Cent. 8. Obs. 6.

(g) Epist. 13. n. 24.

(h) A. 1741. Hebd. 25. n. 1. propius fin.

in the volumes of the Cæsarean Academy, and particularly Dec. 3. A. 5, & 6. Obs. 55; it will be sufficient for me to take notice of one from him whom I frequently and deservedly commend; I mean, Hippol. Franc. Albertini (i).

For a goldsmith, who us'd to labour under the gout, every year, and had more than once driven it away by anointing his feet with petroleum, when the disease was at hand; fell into many more violent disorders, which would not be put to flight, unless by discharging a great quantity of matter from the intestines; which, that you may readily perceive it to have been of a gouty kind, was made up "of lime, or gypsum, as it were, lately cemented together."

This matter, therefore, when excluded from the corroborated joints, frequently falls upon the parts that are contain'd in the abdomen, the thorax, or the cranium; bringing on present danger, and frequently death. And the same things happen when any internal cause prevents the matter from being carried to the joints; and particularly a decrease of vital power. And this you may not only argue from two observations that I have sent you heretofore (k), but you will more evidently learn from the following.

10. George Corneli, cardinal of the holy Roman church, and bishop of Padua, having been, for a long time past, extremely subject not only to pains of the joints, but to pains of the kidneys also; and being now free from these pains, no calculi appearing any more, and the discharge of urine being greatly diminish'd; seem'd to be falling into a dropsy, and perhaps was really so; but that a very powerful diuretic, which was given him, caus'd a great quantity of urine to be discharg'd.

At that time, not the least calculus was seen: nor for many years afterwards was there any symptom of the kidneys being affected; notwithstanding he travell'd in his chariot through a long and rough road, and had changes of horses for the sake of dispatch; I mean, in the year 1721, when he went from hence to Rome. and from Rome to Padua again.

However, though the nephritic pains did not trouble him in those years, he was not, for that reason, free from the arthritic complaints; but these returning now and then at times, were even the more violently and frequently troublesome to him, because, by reason of his being of a fat habit of body, and but weak in his lower limbs, and by reason of his advanc'd age, he was prevented more and more every day, from making use of his wonted exercise.

To these complaints were added a continual costiveness for a long time together, a heaviness of the head, and of hearing after that, together with a propensity to sleep; and, finally, frequent swoonings. In this manner having scarcely pass'd his sixty-fourth year, he at first lost his appetite for all kinds of food; and then was attack'd with the arthritic paroxysm: and now his right hand, and his left knee, began to swell, when he receiv'd the melancholy news of the fatal disorder of his most serene brother Giovanni, Doge of Venice, whom he sincerely lov'd.

(i) Comment. de Bonon. Sc. Inst. Tom. 1. in Opus. de Cort. Peruv. haud ita procul a fin.

(k) Epist. 25. n. 10. & Epist. 40. n. 2.

From this time he, though in other respects a man of a great mind, was seiz'd with incredible grief and uneasiness; and soon after, not only the gouty matter ceas'd to be expell'd to the joints, but even that which had been expell'd return'd into the veins, and brought on a streightness and oppression of the præcordia, a difficulty of breathing, and besides these a kind of sudden paroxysm; wherein the functions both of the brain and heart failing, death seem'd to be at hand.

Then his senior physician, and those who were present, either of relations or friends, hastily sent for me into consultation. I found the patient, however, a little recover'd in the mean time; but so unlike himself in mind, as well as body, that I was immediately struck therewith, and call'd to mind that prænotion of Hippocrates (1): "To do any thing contrary to custom" is a bad sign."

For he who before, in the most difficult affairs, was never wanting to himself, or to others, had entirely given up all hope of life, as I perceiv'd from his words; in which he advis'd us not to attempt to relieve him by our vain endeavours: nay, he even commanded and ask'd it; and this, in particular, he begg'd again and again of me, while I was feeling his pulse, and conjur'd me by that great regard and friendship which he had always borne me.

His pulse, as I then and afterwards perceiv'd, was very bad; for it was very weak, and generally intermitted after two strokes, but always after a few strokes. It was manifest, that, unless the peccant matter could be recall'd to the joints, the patient could not be sav'd. Yet it was not less evident, that the difficulty of recalling it, in that dejection of strength, would be very great; and particularly as he was firmly perswaded in his own mind, that every thing was to no purpose.

I, therefore, said apart to those to whom it was my duty so to do, that he was in the greatest danger: and I took care that this should be immediately signified, by a running footman, to his brother's sons at Venice, in letters dictated by me. However, nothing was at that time, or afterwards, omitted, out of all the things that we had determin'd to do; or, at least, as far as the strength of the patient would permit, and we could prevail upon him by intreaties to submit thereto.

And now the knee began to swell again; on which day we observ'd the pulse to be grown a little better. But nature soon after growing languid, every symptom grew worse; and the difficulty of breathing increas'd: his head was more and more oppress'd with sleep: and not only the internal parts, but the limbs also, were seiz'd with convulsions; though we did every thing in our power to prevent it. And in this manner that most excellent cardinal, that best of priests, and great encourager of learning, was snatch'd away on the tenth of August, in the year 1722; at which time nearly, his brother also, who was the best of princes, and subject to the gout in the same manner, was carried off likewise; all good people being griev'd at the fate of these unhappy brothers.

(1). In Coac. n. 1. apud Marinell.

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As the body was to be embalm'd on the following night, in order to have the funeral-rites perform'd after the manner of his ancestors; I sent a pupil of mine, who was well practis'd in dissection, to take out the viscera, and examine them attentively; for I could not bear to be present myself. From this pupil, therefore, and from the physician whom I spoke of before, I soon after made every proper enquiry in regard to the appearances. And this is the substance of what both of them related.

The belly, which was very fat, had its mesentery, and the small intestines, loaded with a great quantity of fat: the stomach was large; but the coats thereof were greatly extenuated: the liver itself was in a natural state; but the gall-bladder was small, and the coats of it so thin and flaccid as to be broken by the touch; a round calculus falling out, which was not small in proportion to the smallness of the vesicle, and was the only one contain'd therein, and that without any bile.

The kidneys were larger than they naturally are, but the right was the largest; so that, together with the fat whereby it was cover'd, it was almost equal to the size of a man's head. Therein were eleven stones, most of them large and ramifying. In the left was one, and that also was ramified and small.

These calculi, in their colour and branches, resembled nothing more than black coral; for they brought them to me that I might look at them; but they could not have been seen by those who have hinted, that they were similar to the stones which Alghisi (m) has delineated in his third table. However, that substance of the kidneys which lay next in order around them, was hard and callous.

Upon opening the thorax, nothing was found in the lungs that was preternatural; but the trunk of the aspera arteria had its cartilages very hard, and not easily yielding to the hand, when constringing them. Which species of disorder was also observ'd in the iliac arteries, and in the neighbouring trunk of the aorta, from whence they arise. Nor was it wanting within the thorax; but there the more the great artery receded from the heart, the more manifest it became. And this artery was much broader within the thorax than it ought to have been.

In the heart was no polypous concretion: and but a very small portion of blood, and that frothy. Nor was there much blood in the whole body; if you except the integuments of the head, in cutting into which a pretty considerable quantity of blood flow'd out.

The cranium being open'd, besides the serum which was observ'd therein, the whole substance of the cerebrum was lax to a very great degree.

II. Too many and considerable disorders, besides those that were manifest, lay hid in this body, to suffer the arthritic matter to be thrown back upon the joints, either by nature or by art. It is true, the laxity of the cerebrum appear'd, in great measure, from the preceding symptoms of heaviness of the head, and of hearing, and the propensity to sleep.

But would you have suppos'd it to be grown so lax, as to be already almost unfit for performing its principal office, and very fit for receiving a

quantity of arthritic serum; from whence those external and internal convulsions, to which the streightness of the præcordia, and the very great difficulty of breathing, as the lungs were in other respects unhurt, (for neither did Joerdenſius (*n*) find any thing morbid within these viscera, in a case almost similar) were to be attributed.

And with what force could the great artery, that was wider than usual, and had its coats very hard; as the iliac branches of it had also; impel the peccant matter into the upper and lower limbs? It was certainly more likely to retard, now and then, the motion of the blood; from whence not only those deliquia, but that last attack, and the intermission of the pulse, are to be accounted for: especially since the heart was greatly debilitated, as appear'd from the weakness of the pulse, and not without reason; inasmuch as the strength of the heart could not be preserv'd by such a brain as that was.

To this was added, that, though the heart was weak, and the arteries, in their state of hardness, had by no means strength equal to circulate even the best and most vivid blood; they were under a necessity of propelling an effete and impure blood: for this was shown to have been such, not only by the latter part of his life having been pass'd without any exercise, or agitation of body, but also by the many preternatural appearances found in the belly.

For, in the first place, the stomach, in so lax and extenuated a state, could not well prepare the aliments. And, in the second place, the intestines were not able to prepare the chyle; as no bile was now discharg'd from the vesicula fellis, and only a small quantity, and that not good, had, for a long time, flow'd down; the former of which circumstances was prov'd by that small bilious calculus, and the latter by the smallness of the cyst, and the long-continu'd costiveness of the intestines: and you readily perceive how far this striction of the bowels was likely to prevent the purgation of that impure blood.

And as to the purgation finally, which blood of that kind certainly needed, if any at all did, as that is made principally by the skin, and by the kidneys; this was not done so much by the skin, in a quiescent state of body: and who can suppose that it was sufficiently done by the kidneys, which were so oppress'd, and in part callous?

Nor does it escape me, who took notice of the cause thereof, upon a former occasion (*o*), and particularly confirm'd it in fat persons; nor does it escape me, I say, that calculi of the kidneys are often join'd with the gout; and I even know that, on account of these calculi, the blood of arthritic patients is less purg'd; and that by these means the gouty matter is encreas'd. Yet I would not have you infer from hence, that, in all these persons, this matter could not be so well propell'd to the joints: or if it should have happen'd to recede therefrom, and fall upon the internal parts, that it cannot be recall'd to the joints.

And indeed, I remember, that in the senator of Bologna, whom I took

(*n*) Aët. N. C. Tom. 4. Append. n. 5. in fine § 5.

(*o*) Epist. 40. n. 3. & 5.

notice of above (*p*), and who was troubled with calculi of the kidneys also; besides the gout; when the knees and hands began to swell, and soon after, of a sudden, and without any manifest cause, the pain and the tumour vanish'd almost totally, and a consequent difficulty of breathing alarm'd every one; I remember, I say, that in this patient however, the peccant matter was recall'd to the joints by Albertini, by means of the same remedies we made use of here to no effect.

But then the age was not the same, nor had the senator any grief to oppress his mind; nor those disorders of the brain, and the great artery: and although calculi did not fail to be discharg'd now and then, yet they were not to be compar'd with those of which we are at present speaking.

12. For, in the first place, these resembled the form of coral. Which it is necessary you should attend to, not so much for the sake of admiration, as for knowing their cause and effect. For you will read in the *Sepulchretum*, that calculi were found in the kidney, which resembled the shape of a mouse (*q*); not to mention those which resembled the form of coral (*r*). And Eustachius, who gave almost the first observation of all, of a calculus in the form of coral, has sufficiently shown the cause of a figure of this kind (*s*). According to which, Piccolhominus (*t*) has afterwards explain'd the form of a mouse also, in a calculus describ'd by him.

And if the history thereof had been transferr'd into the *Sepulchretum* from the author himself; the readers would not have been ignorant after what symptoms it had been found. Therefore, as the calculous matter stagnates in the pelvis, and the beginning of the ureter; it is by that means moulded into the figure which resembles the body and head of the mouse; or which resembles a stump of coral: and as it stagnates, at the same time, in the tubuli that open into the pelvis; so the calculi represent the tail and legs of a mouse, or the branches of coral.

When the urinary passages are all, or most of them, beset with calculi in the manner I have mention'd; and the very small and contiguous instruments whereby the urine, if separated from the blood, are compress'd; you certainly see that the secretion, and excretion, of the urine must be diminish'd; or the last altogether intercepted: and unless assistance be brought by nature, or by art, or by both, that a dropsy must begin to come on, or some other great disorder arise.

You see then, from what cause the dropsy had begun to arise in the very eminent man in question, when the urine being urg'd on by a very strong diuretic remedy, the obstructed passages were partly clear'd thereby, but the passages which were not as yet beset with calculi, were immoderately dilated; and this was the chief part of the effect: so that the urine flow'd plentifully then, and afterwards; nature lending her assistance at the same time, as she, after that, sent the matter, which would have added new branches to the calculi, more frequently, and in greater quantity, to the joints.

But although some tubuli were preserv'd in an open state, and even wider

(*p*) n. 8. in fin.

(*q*) l. 3. S. 22. Obs. 26. § 6.

(*r*) Ibid. Obser. 21. § 4. & seqq. & S. 25.

Obs. 20. & S. 28. Obs. 26.

(*s*) Vid. § 4. cit.

(*t*) l. 2. Anat. Prælect. 23.

than naturally; yet many remain'd entirely uselefs, being entirely full, and stopp'd up with branches of calculi: and what is more to be attended to, the substance of the kidneys, which lay nearest round about them, was render'd hard and callous together with them, by continual compression.

And this was the reason, why no uneasiness was perceiv'd in the kidneys, even from the greatest agitation of body; especially as the very close adhesion of the tubuli to the branches of the calculi, prevented these from being agitated: as you will learn from the Sepulchretum (*u*), that it had done in others, when great stones, similar to coral, and "driven in like nails or "spikes," adher'd immoveably in the kidneys.

But so many parts of the substance of the kidneys being made callous, and for that reason uselefs, can we suppose that the function of these viscera had suffer'd no detriment?

Besides, these calculi were not only in great number, but large; so that, of course, the remaining substance of the kidneys would be partly overloaded, and partly distracted. And the parts which were thus over-loaded and distracted, certainly could not perform their office perfectly, in separating the uselefs and noxious particles from the blood, which at other times they are wont to do. Finally, these calculi were in the body of a man, in whose gall-bladder another was contain'd; and consequently in that body which needed more the separation of those particles, as is hinted above (*x*).

Nor am I ignorant, indeed, that calculi of the gall-bladder may also be produc'd in the same bodies that are liable to calculi of the kidneys; but have even confess'd it formerly in another letter (*y*), wherein I have made mention of those found in this very eminent cardinal: nor is any thing more easy for me, than to produce a great number of observations, of those persons who have found them in both places at the same time.

For besides so many others, that you will find taken notice of by me in other places (*z*); and besides that remarkable one which is referr'd to by the celebrated Pohlius (*a*), and might be added to the Sepulchretum; I remember to have read six in the Sepulchretum, and all these in the third book (*b*): among which is one of Grembsius, that agrees with the one I have here given in this circumstance likewise, that "no gall" was found in the gall-bladder. But none of these persons, that I know of, was troubled with the gout: or if any one was troubled therewith, he, at least, had not so many other considerable injuries of the vessels and viscera.

13. There are other disorders also, which sometimes shew themselves in the joints; as, for instance, that which I saw in a woman, whose dissection is, for more than one reason, worthy to be describ'd to you on the present occasion.

14. An old woman, who was the mother of many children, had been seiz'd with an apoplexy about three months before. This apoplexy had been succeeded by a paralysis of both limbs, on the right side; yet in such a man-

(*u*) Cit. Obs. 20. & 26.

(*x*) N. 11.

(*y*) Epist. Anat. 1. n. 48.

(*z*) Epist. 37. n. 43.

(*a*) Dissert. de Prost. calcul. affect. §. 7.

(*b*) S. 22. Obs. 1, S. 23. Obs. 4. §. 10, S. 24. Obs. 2. §. 12. Obs. 6. §. 4. Obs. 10. fetunda §. 4, & S. 25. Obs. 9. §. 5.

ner, that they could be mov'd a little, and had the faculty of feeling left entire. But last of all; when a kind of sleepiness, as it were, had come on, and a considerable hesitation of speech; being brought into the hospital, she there gradually sunk away, and died: this was after the beginning of December, in the year 1746.

Of the many things which I observ'd in the course of several days dissection, in this body, these are the principal that relate to the present subject.

In the belly, the uterus was so short in its length, that even externally, from the orifice to the upper part of the fundus, it was scarcely equal to two fingers breadths. But it was wholly contracted into itself, and conglobated; so as to resemble, in some measure, a kind of little ball, depressed on the fore-part and back part, the parietes being thicker in proportion: and in cutting into the substance of these parietes I found it to be livid, and did not judge it to be perfectly sound. The larger extremity of one of the tubes was not only impervious, but entirely grown into one substance with the testicle, which, like its fellow, was hard, and in some measure chequer'd on its surface.

In the thorax, the heart contain'd large polypous concretions.

On the integuments of the skull, where they cover'd the left temple, a large blackness, as if from contusion, appear'd externally and internally; although no blow had been receiv'd, upon the head, any little time before death, (as far as we could learn by enquiry) or soon after. In the whole left hemisphere of the cerebrum, contrary to what the hemiplegia had given us reason to expect, no disorder was found.

But in the right, I first observ'd that the vessels which pass through the pia mater, especially where they corresponded to the vertex of the head, were very turgid with blood: and through the same membrane I saw water, as it were, mix'd with particles of air; and this water was really beneath: but in so small a quantity, that the pia mater was not easily drawn off by the fingers. And after this I found a singular disorder of the substance of the brain, and that a very considerable one; being about the vertex, to the extent of three or four fingers breadths, in the longitudinal direction of the head: and for as many in breadth, where the disorder was the widest; for in some places it was much more narrow.

This disorder began from that upper border of the hemisphere, where it is nearest to the left side, and extended itself, from thence, in breadth. From the surface of the cerebrum; which it occupied; it did not descend inwards more than an inch. In the whole of that situation then, which is mark'd out, both the substances of the cerebrum were of a faint and brownish blood-colour; and not less soft than if it had been, for a long time together, cut, and in a manner chopp'd with a knife, so as to become almost fluid. Yet it was no where foetid.

But the remaining part of the cerebrum; except that, if you compar'd it with the cerebellum and medulla oblongata, it was more lax than these parts; offer'd nothing that was preternatural, even upon the most diligent enquiry; so that I did not find any serum extravasated in the ventricles, although I observ'd the pituitary gland to be very much contracted, and sunk in its situation.

Finally,

Finally, as in the left knee (which was cut into, in order to demonstrate the internal ligaments, cartilages, and glands, to a crowded circle of spectators, who had likewise seen all that has been spoken of above) I saw no mucilage; I began to inspect all the parts very attentively, which, however, were pretty well lubricated: and I saw the cartilaginous crust of the rotula, in the part where it corresponded to the external condyle of the femur, rubb'd away, as it were, and mark'd with slight and small parallel furrows; much in the same manner as if any one had press'd the point of a chissel, or graving-tool, upon it, and drawn the instrument from the top to the bottom several times: and the crust of the condyle, which I just now mention'd, where it was turn'd to the same part of the rotula, was so extenuated as to appear somewhat livid, by reason of the bone being seen through it.

But what was much more worthy of observation than all these things, was a great number of globules, the five largest of which were almost equal to small grapes; the remaining globules, which were more than twenty, being some a little less, and some much less, than the former. All of them were white, and of a smooth surface: and all of them, being disjoin'd from each other, were prominent within the cavity of the joint; adhering by a very small part, and even being continu'd, the lesser of them to the capsular ligament, about the inferior sides of it, (so that some of them were dispos'd into an oblong series) but the larger to a cartilaginous crust; or, rather, to the fimbria of a mucilaginous gland, which closely cover'd the cartilaginous crust, in some recesses of the bones that belong to the cavity of the joint.

Yet others were entirely bony; and some contain'd a bony nucleus under a cartilaginous crust. I should have examin'd the other knee likewise, to see whether any of the same appearances were there, and whether any thing there might better shew their origin; but I was disappointed, as I found that this had been buried together with most of the other parts of the body,

15. But from whence-soever their origin was, this is certain, that, if they had grown out from the mucilaginous glands, they might, by diminishing the secretion of the mucilage, do an injury to the joint; or, if they were from any other part, and had not hitherto done much mischief, (since this could not be known for a certainty) they would have been injurious, to a considerable degree, by their increase.

And, indeed, if any one should happen to say, that some one of the smallest of those bony globules was pull'd away from its situation by the agitation of the knee; and, being interpos'd betwixt the condyle and the rotula, had made those appearances in the cartilage that are spoken of; he would not assert any thing that was utterly absurd: although I remember, when, in the following year, I examin'd the knee of a man in the same place, to have found the cartilaginous crust of the same condyle corroded, as it were, in some measure, in that same part where it touches the rotula, though not for a larger space than what the nail of a man's little finger could have cover'd; yet some other small spaces in that neighbourhood were affected in the same manner: however, there was no appearance of disorder in the rotula, nor any-where else in the whole joint; and still less did any globules protuberate. The description of which circumstances I thought

less proper to be pass'd over, because I do not think I have read any author (c) who has made mention of a disorder of this kind in the knee-joint.

Yet when I was revising this letter, there came out an observation of the illustrious Haller (d) upon another joint, which was pretty similar to this. That is to say, in a decrepid woman; in whom many of the arteries, and some of the valves, of the heart, were not without bony scales, or the beginnings thereof; while he was inspecting the joints of the lower jaw, with the bones of the temples, he observ'd one of them to be "stripp'd of its cartilaginous crust; and the lunated cartilage almost half-consum'd, and perforated. And the crust, which attrition had destroy'd, the same attrition had chang'd into almost twenty globules, half-bony, and collected loosely in the cavity of the capsula." In the other joint there was nothing of this "wonderful appearance," but every thing was in a natural state.

I should have copied more to you, if he had added more, that you might have compar'd all the circumstances with my observation. But it does not seem that it was in his power to learn, what, and how great, inconveniences the woman had suffer'd therefrom.

Nor have I read many authors, who have taken notice of that kind of corruption in the substance of the cerebrum, which I found in the old woman in question, as I did nearly in a few others (e).

Moreover, a paralysis of the body, on that side which lies beneath the injury of the brain, instead of being opposite to it, is not a very common thing. You may, therefore, add this observation to the few others which I have referr'd to heretofore (f), among the much greater number of opposite paralyzes, as if by way of some exceptions: unless you should happen to say, that the injury here was either not sudden, or too remote from those parts of the brain, (I mean, the ventricles and the protuberances therein) to the sudden injury of which, chiefly, the hemiplegia in the opposite side is observ'd to succeed.

Yet whether this can be said of that observation which I have referr'd to formerly (g), as propos'd by Curti, a Neapolitan physician; it is, perhaps, not very easy to determine.

For to a resolution of the right side, in consequence of an apoplexy, he saw a correspondent corruption of the substance of the cerebrum, (not far unlike that of which I was speaking just now) not in the left, but in the right hemisphere; and that in the whole of it; so that even the meninges were converted into a mucous substance: although, as he says nothing of the crura medullæ oblongatæ, which grow out into those protuberances, there may seem to be some reason for doubt still remaining.

16. There is, in fact, so great a similarity betwixt the rheumatism and the gout, whereof we treat in this letter, that physicians have distinguish'd the former from the latter but lately; although not so lately, that this was first done about the middle of the preceding century, as some say who forget

(c) Vid. Epist. 69. n. 13.

(d) Progr. de indur. corp. hum. partib. § 5.

(e) Epist. 5. n. 6. & Epist. 9. n. 16. 18.

(f) Epist. Anat. 13. n. 25.

(g) Epist. 9. n. 19.

Ballonius (*b*). But no mention in particular is made of rheumatism in the Sepulchretum, not even in that place where it would have been most proper; I mean, about the end of the eleventh section of this fourth book, where it relates to pains “of the external parts.”

Yet I do not wonder at it, as I scarcely remember to have lit on any other dissection of a rheumatic patient, but that taken from the mouth of Drelincurt, and made mention of by Havers, in his Osteology (*i*); in which dissection Drelincurt found “a jelly concreted on the surface of the muscles, equal to “two or three ducats in thickness.” Which observation might be added to the part of the section of the Sepulchretum that I mention’d before; as it is very short, and is made up, in good measure, of histories which are produc’d in other places; and even ends in one that had been already given in this very page (*k*).

I, who have treated of things which relate to the other parts of the same section, in other places, will subjoin here, lest I seem to have entirely omitted this last part, two observations of our Mediavia’s; the first of which relates to pains of the external parts: and the other would have seem’d to relate thereto, if dissection had not discover’d the case more clearly.

17. A young man, who was a goldsmith, had a violent pain in his loins, on the right side, which yielded to no remedy. A year being thus pass’d over, the pain began to attack the left side of his loins also: nor was he free from pains in his neck, which seem’d rheumatic; when an inability of moving his legs came on, a hydrops tympanites, and finally death, about the middle of April, in the year 1753.

We were permitted only to cut into those external parts of the body which had been the seats of that very obstinate and violent pain of the loins. The skin, therefore, and the adipose membrane, being taken off from these parts; in the cells of which membrane some water was seen; and that large tendon, from whence the muscle latissimus dorsi arises, being remov’d, and no mark of injury being observ’d in this tendon on either side; when we came to that thick fleshy body which affords a common origin to the sacro-lumbus and longissimus dorsi muscles; behold! an unusual colour appear’d in that body, such as we see in old furniture made of the nut tree; and yet not in the whole of that body, but only for about the space of five inches in length, and in breadth in like manner: and this was continu’d inwards, from the surface, in such a manner, as to be seen in the subjected muscles likewise; that is, the sacro-lumbus and quadratus lumborum.

The fibres, in the whole of that space which I have pointed out, were surprizingly lax and yielding, and disjoin’d by frequent coagula of blood lying betwixt them. And all these disorders that I have spoken of, appear’d so much the more, in proportion as the muscles were nearer to the spine: but without that space in the loins, neither a preternatural colour, nor any thing preternatural, was observ’d in the muscles. And, indeed, there was

(*b*) Vid. ejus librum de Rheumatismo, & § (*i*) Disc. 4. ubi de Rheumatismo.
quæst. medic. illi adjectam.

(*k*) Obs. 7. § 11. & 7.

no very disagreeable smell in the part where these disorders were observ'd. All these appearances were found in both loins; but those in the left were much the slightest.

18 I am here aware that you will make two enquiries of me; one, from whence arose that inability of moving the legs? the other, from whence the pains in the neck? And, indeed, you will easily, of yourself, conjecture the cause of these pains; if, bearing in mind my observations (*l*) which I have confirm'd in the following years, you are not ignorant that the longissimi muscles, whose origins we found to be diseas'd in this body, were continu'd to the neck, in all those bodies wherein I have made the enquiry.

And as to that inability of moving the limbs, perhaps, nothing forbids us suspecting it to have arisen from hence, that the disorders observ'd in the quadrati lumborum muscles, also, (and these so much the more considerable, as they approach'd nearer to the vertebræ) might, at length, have reach'd to those nerves from which the crural are made up; not to say, to the psoæ muscles themselves; as those disorders were continu'd from the external to the internal parts: for that they had not been propagated from the internal to the external parts, notwithstanding we were not allow'd to examine the belly, appears from this circumstance, that there were no complaints of the kidneys, and that no symptoms of any injury of these parts were taken notice of; and the legs were not weaken'd when the disease was incipient, but when it had already proceeded for some length of time.

19. Now take the second observation, which, on the other hand, though it might seem to relate to external pains, yet, in fact, was found to relate to the internal parts, and therefore better deserves not to be pass'd over.

20. A monk of Padua, who was, at least, seventy years of age, had begun, after a kind of fever attended with a coldness, to labour under pains, which he suppos'd to be from defluxions, as he call'd them. These pains seem'd to lie in the muscles, which were about the os innominatum on one side, and a little above anteriorly: and in those that are extended through the femur on the same side, being sometimes more, and sometimes less troublesome; so as not to prevent him from walking. When he had suffer'd these pains for two or three years, they at length grew more violent: and he died about the middle of July, in the year 1737; there appearing, the day before he died, in the groin of that side, a tumour wherein a matter was perceiv'd to fluctuate.

The abdomen being cut into in that part, in order to enquire from whence this matter had its origin; contrary to all expectation, a great quantity of pus was found betwixt the peritonæum and the os innominatum, which was there cover'd with those muscles that I shall mention presently.

21. You will think that this observation deserves so much the more to be attended to by physicians, as internal disorders may the more easily impose upon us under the appearance of defluxions, and degenerate into abscesses of that kind: and in proportion as the same disorders, perhaps, more frequently lie hid under a mask of this kind.

At least, this was seen three times by one surgeon; I mean, the celebrated Benevoli (*m*); who adds, that the same thing was likewise seen by Querci: and he very properly explains what kinds of tumours, lying near the muscles which we call psoæ, or iliaci interni, may not only be the cause of contractions that are troublesome in the thighs; but, finally, may also, when suppurated, send down pus into the upper parts thereof. These remarks, however, you will see more at large in the author himself. Farewel.

LETTER the FIFTY-EIGHTH

Treats of the Lues Venerea.

1. **I**N the letters that I have already sent you, I have communicated many observations which relate to the lues venerea. There is, then, no reason why you should be surpriz'd, if I say that there are scarcely any left to be copied here. But if you inspect those letters which I shall immediately refer to; you will see that this has been sufficiently done, when, on the occasion of other diseases, which either arose from this, or were join'd with it, I did not omit making mention of this disorder; or, if there seem'd to be any internal injuries from thence, that these were not omitted likewise.

2. For in the very first letter (*a*), when I spoke of severe pains in the head, I have told you what disorder there was in the meninges, the cerebrum, and cerebellum: and what in the cerebrum and cranium, when, in the ninth letter (*b*), I wrote of the epilepsy. And in the forty-second letter (*c*), and the forty-fourth (*d*), we meet with injuries either in the epiglottis alone, or in the other cartilages of the larynx also, and the aspera arteria: and in the same letters (*e*) (*f*) internal diseases of the great artery are spoken of; so that, supposing these circumstances, it is less to be wonder'd at, that, in the eighteenth letter (*g*), this artery is dilated into an aneurism; or that, in the fortieth (*h*), twenty-seventh (*i*), and fifty-third (*k*), an aneurism, moreover, or the artery itself, could be ruptur'd.

In the eighteenth letter (*l*) you have the lungs on one side purulent; but particularly in the twenty-second (*m*). And in the fourth (*n*), forty-second (*o*),

(*m*) Due Relaz. Chir. Vid. I.

(*a*) N. 14. (*b*) N. 23.

(*c*) N. 39. 40. (*d*) N. 15.

(*e*) N. 39. (*f*) N. 3.

(*g*) N. 25.

(*i*) N. 28.

(*l*) N. 25.

(*n*) N. 19.

(*b*) N. 29.

(*k*) N. 7.

(*m*) N. 10. 11. 15.

(*o*) N. 2. 40.

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forty-fourth (*p*), and forty-eighth (*q*), you have the kidneys purulent, or otherwise diseas'd; and other parts of the urinary organs. Moreover, the forty seventh letter (*r*) speaks of an excrescence in the uterus, and, at the same time, a cicatrix in the lower part of the vagina near to the urethra.

In the forty-fourth letter (*s*) you have an unusual moisture and redness of the male urethra; and in the same (*t*), and the forty-second (*u*), you have the urethra narrow and contracted in some places: and these two last mention'd letters (*x*) (*y*), the fourth (*z*), and the fortieth (*a*), speak of excrescences of the urethra, or the remains of excrescences.

And; to omit the fifty-second letter (*b*); the eighth (*c*), the twenty-seventh (*d*), the forty-second (*e*), and the forty-fourth (*f*), shew these larger canaliculi to have been generally, or in part destroy'd: and, finally, this last letter either speaks of other traces of disorders in the urethra (*g*), or of the inflammation of the part surrounding Littre's gland (*h*); or of the induration of one of Cowper's glands (*i*), or its being contracted and strigose (*k*); or of the orifices of both the ducts not being in a natural state (*l*); or of the orifices of those ducts, which bring in the semen, being stopp'd up (*m*) or, at length, of the vesiculæ seminales being contracted, and without moisture (*n*).

3. Nor, indeed, have I sent to you observations of these disorders only that I have spoken of; but even in those two letters particularly, that often made mention of just now; I mean, the forty-second and forty-fourth; I have pursu'd, pretty much at large, some symptoms that attend, or are subsequent to, the lues venerea: that is to say, the gonorrhæa, and the caruncles, as they are call'd, of the urethra.

For in that forty-second letter (*o*), I have not omitted to say what others have thought or seen, and what it happen'd to me to see, in respect thereto. And in regard to the gonorrhæa, on the subject of which the whole forty-fourth letter turns; I have said, in order, what has been seen by others, and by myself, in regard to its particular situations: and have not omitted some other things that related thereto.

As, therefore, I am determin'd not to repeat any thing which has been already said, it now remains only to produce three or four observations in this place, which relate to the lues venerea; as I have no more than this number still left behind. The two first of these are from Valsalva.

4. A woman, who had completed her fiftieth year, was attack'd with a pain in the lower jaw, attended sometimes with so large a flux of blood, that it was intended to have restrain'd this discharge by the application of the actual cautery; if it had not ceas'd of itself. In a little time after, the woman began to be troubled with pains in her bones: with which having long

(*p*) N. 15. 27.

(*q*) N. 32.

(*r*) N. 28.

(*s*) N. 3. 5. 7.

(*t*) N. 10.

(*u*) N. 39. 40.

(*x*) N. 7. 10. 18.

(*y*) N. 39.

(*z*) N. 19.

(*a*) N. 29.

(*b*) N. 30.

(*c*) N. 6.

(*d*) N. 28.

(*e*) N. 39. 40.

(*f*) N. 7. 9. 12.

(*g*) N. 9. 14.

(*h*) N. 3.

(*i*) Ibid.

(*k*) N. 12.

(*l*) Ibid.

(*m*) N. 7.

(*n*) Ibid.

(*o*) N. 38. & seqq.

(*b*) N. 15.

(*k*) N. 12.

(*m*) N. 7.

been afflicted, she began, as often as ever she was mov'd, to complain that all her bones were broken; and, indeed, those who stood by her heard a crackling in her joints at that time. To this symptom another was afterwards added, that the bones of the lower limbs began to be bent, as if they were made of wax; and to be in pain even on the slightest motion.

At length, in examining her body after death, the ossa innominata, the ossa femoris, and tibiæ, and those bones that make up the arch of the cranium, were found to be flexible, just as if they were made up of pretty thick paper: on their surface they were spongy; and at the medittullium, in some places, carious.

5. From whence that great quantity of blood was discharg'd, of which mention is made in the beginning of this history, Valsalva has omitted to say. But I have heard, from those who had seen the woman together with him, both when living and dead, that she had an abscess on one side of her neck; so that I shall suppose it to have flow'd from thence. The same persons also added, that some other bones likewise, among which were many of the ribs, and the bones of the feet, were flexible in the dead body; and admitted the knife like cartilages: and that all the bones, which yielded to the force that bent or compress'd them, discharg'd a certain fluid, similar to diluted blood, during the action of bending or compressing.

I afterwards saw these bones likewise myself; for Valsalva had preserv'd them: the oblong ones were curv'd into the form of an arch, and those that compos'd the vault of the cranium depress'd into the figure of a plane; and all of them were of a very bad colour and smell, because they could not be clean'd internally, giving an unctuosity to the fingers in handling them.

But as they had now been preserv'd for a long time; I could not learn some circumstances which I should have enquir'd into in their fresh state, and even in the body itself: among which was this; in what state the heads of these bones were in the joints; that is, whether they were more or less daub'd over with mucilage; I mean, on account of that crackling which was heard in the joints, by the assistants, when the patient mov'd them: but still much more should I have wish'd to know in what state the genital parts were, in a woman who, they said, had been so infected with the lues venerea, that they did not doubt but this very great disease of the bones had taken its origin from that disorder.

6. We should have the most ancient examples of the human bones being become soft, if what Sachsius (*p*) seems to think, with Peter a Castro, that this disorder is call'd "by the Arabians *Alachad*, and *Alzemena*, and was cur'd "by Avicenna," were certain; as it is certain, from the Latin increas'd interpretation of Arabic words of Andreas Bellunenensis (*q*), which is publish'd with Avicenna, "that there is an *alzemena*, or *zemena*, when the patient, by "reason of the softness, or paralyfis, of the feet or hands, is prevented from "moving those limbs: so that this title of the observation of Peter a Castro, *De Membrorum & Ossium Mollificatione*, seems to refer to the resolution or pa-

(*p*) In Schol. ad Obs. 37. A. 1. Dec. 1. Eph. N: C.

(*q*) Ad vocem *Alachad*.

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ralfis of the limbs, or, as the interpreters of Avicenna say, to the *mollification* (r) thereof; and not to the softness of the bones.

Yet there are examples sufficiently ancient, which Fernelius (s), and Ruellius, whom he quotes, have deliver'd down in writing; adding, that the disease had been happily cur'd by means of aluminous baths: which method you will understand, from Sachsus (t), that others also had follow'd.

But as I could not learn from those cases what was the structure or nature of these bones thus soften'd, as they appear'd from dissection, by reason of firmness being restor'd; so neither have I learn'd this circumstance, in the manner I hop'd I should, from other cases that are generally enumerated; as, for instance, from those that are mention'd by Jacobus Hollerius (u), by Gulielmus Fabricius Hildanus (x), by Peter Borellus (y), by Thomas Bartholin (z), and by Daniel Prottenius (a).

And, indeed, I even omit those which relate rather to a peculiar degeneracy of any one bone, than to that which is at the same time common to most of them; and among these I place that which is related from Bartholin, whom I have already mention'd, in the Ephemerides of the Cæsarean Academy (b).

Coming down, therefore, to those authors who have flourish'd in our memory, I first found Gabrieli (c), among the Italians, who, not later than the eighty-eighth year of the preceding century (for Gagliardi (d), mentioning the same observation briefly in the following year, has said that it was "very lately communicated" to him); who, I say, about that year, then, in dissecting the bones of a matron; none of which had retain'd their former hardness, and whose more oblong bones had almost all of them become flexible to every side; found the latter converted, not into a fibrous flesh indeed, but into a reddish flesh.

After this I read an almost similar observation of Courtialis (e) on another woman: and even not only all her bones, the teeth excepted; of which Gabrieli has made no mention; could be bent, but all of them resembled fungous and soft flesh, impregnated with a bloody serum.

And although I do not see, that some observations of the celebrated surgeon Petit (f) are of a different kind, as they speak of the bones being chang'd into a substance similar to flesh, without the neighbouring or interpos'd cartilages being injur'd, as far as he could observe; and although they have brought back to my memory, that those thick cartilaginous ligaments, which are interpos'd to the bodies of the vertebræ, were found to be quite uninjur'd where the vertebræ were deeply diseas'd by a caries (g); yet, as

(r) Vid. c. 2. Fen. 2. l. 3. Can. Avicen.

(s) De abdit. rer. Caus. l. 2. c. 9.

(t) Schol. cit.

(u) In adjectis, l. 1. de Morb. Int. Raris quibusd. n. 7.

(x) Cent. 1. Obs. Chir. 45. & Cent. 6. Obs. 74.

(y) In fine Epilog. additi ad Cent. 4. Hist. & Obs. Med. Phys.

(z) Cent. 6. Hist. Anat. 40.

(a) In Act. Med. Hafn. Vol. 3. Obs. 24.

(b) Obs. 37. supra cit.

(c) Eph. N. C. Dec. 3. A. 2. Obs. 3.

(d) Anat. Oss. c. 2. Obs. 3.

(e) Hist. de l'Acad. R. des Sc. A. 1700. Obs. 2.

(f) Mem. de la même Acad. A. 1722.

(g) Epist. 40. n. 26. & 29.

these observations of Petit never speak of that disease as occupying many parts at the same time, and always as being join'd with a tumour, they cannot be referr'd by me to the species whereof we are speaking.

And the same must be said of many others; as, for instance, of that which is from Mauchart (*b*), of the upper parts of the thigh bone being grown large, and so soft as to yield to the handle of the knife, and even to the fingers; and, when press'd, to emit a kind of bloody medulla, similar to that which is in the small cells of the bones: or of that observation which is twice publish'd from Nebelius (*i*), of a disorder which consisted in the much greater part of the same bone being converted into a large, whitish, and spongy mass; except that a great number of small lamellæ remain'd divided within it, and the medullary system was semi-lacerated and become empty: the whole being surrounded by a white, hardish, and even almost cartilaginous membrane, which was suppos'd to be the periosteum.

A membrane of this kind, you will also find, was met with by Alexander Camerarius (*k*), surrounding tumours, under which, in a ricketty boy, certain parts of the ossa humeri and femoris were so consumed and wasted away, as to have degenerated into a fluid matter; not at all foetid, of a white colour, and almost like coagulated milk: which disorder he therefore call'd "the white caries of the bones."

If you have the dissertation of Platner which is intitled, *De Thoracibus*; you will be able to see, whether, and how far, those words of that dissertation which I have read in the *Acta Eruditorum* (*l*) relate to this subject: "That the bones, in those who are pretty far advanc'd in life, are sometimes "so preternaturally soften'd, and become waxy and fragile, as to be fluid "as if melted down; and this was found, by his own experience, in the "right os innominatum of a certain man."

Finally; to return from fluid bones to those that are easily to be cut with the knife; there is extant an observation of the illustrious Haller (*m*) upon the fibula; which, without any change in the periosteum, being become quite fleshy, or similar to soft cartilage, was made divisible by a knife, in the same manner as pretty hard cheese: being tumid, and internally eroded by a foetid ulcer.

All these observations; though, for one or other of the reasons mention'd above, or for both of them, they do not relate to the subject in question any more than the observations of Petit; I, nevertheless, was not willing to pass over: as I do not doubt but you may sometimes transfer these appearances, that are found in particular parts, to those which will occur in many at the same time, or in almost all, in order to explain them thereby.

But now, to refer the observations of Gabrieli and Courtialis, taken notice of above, to that species of disorder which we have undertaken to consider here; as the observations are very similar to that given above from Valsalva in this respect also, that pains of the whole body had preceded this state of

(*b*) Eph. N. C. Cent. 9. Obs. 30.

(*i*) Act. N. C. Tom. 1. Obs. 15. & Tom. 1. Obs. 111.

(*k*) Tom. cod. 1. Obs. 53.

(*l*) A. 1751. M. Sept. P. 2. ex ejus Dissertationum, pag. 139.

(*m*) Opus. Pathol. Obs. 54.

softness in the bones; it is certainly surprizing, that, after so great a similitude of disease while those three women liv'd, so great a dissimilitude should be found in the bones after death: so that, although in two of them they resembled flesh, in one they were become spongy and carious, yet, nevertheless, still remain'd in the form of bones.

But a much greater dissimilitude (unless you should chuse rather to account for this, and others similar thereto, from the excessive progress of the disorder) occurs in that instance which is made mention of by Boerhaave (*n*). For a man, who had liv'd with his bones in a state of softness, and not without the most severe pains, had his bones, after death, "similar to a pulaceous substance, and such as is prepar'd from bones in Papin's digester."

And this being the state of the question, you naturally see that, if at any time disorders of this kind recur, the physician must be very cautious in predicting what will be the state of the bones; as the state was found to be so very different in the four bodies after being affected by these disorders.

7. And of these three, the species of disorder which was found by Valsalva cannot be referr'd to that constitution which physicians have sometimes observ'd, but particularly from the lues venerea; I mean, a caries which has proceeded so far, that the bones may be easily broken in the dead body, or by any motion whatever of the body while living: more than one example of which kind, (not to digress too far in pointing out what Blawius (*o*) and others have publish'd) you have, in this ninth section of the Sepulchretum (*p*), and in the fifth (*q*) of this very fourth book.

For in the woman of Valsalva's in question, the bones indeed were spongy on their surface, and carious; but in other places at the medullium, and in the whole part which lay betwixt the medullium and the surface, they were without a caries. They were not broken, therefore, but bent; and by that means shew'd that the fibres were not in great measure eroded and destroy'd, but soften'd.

Yet from whence this softening? For if they had been made fleshy, or pulaceous; you would have the most ingenious men to follow in their conjectures, that into the place of the bony particles, which are suppos'd to be rubb'd off, and carried away, from the bones; even in healthy persons; new particles of the same kind are not supplied, as they ought to have been: but particles of a totally different nature, which can never coalesce into the hardness of a bone.

If, therefore, it is your pleasure also to indulge yourself in conjectures; you must here endeavour to think of a humour, which, when carried into the bones, could soften them. For without the body; that is, when the bones are much more rigid; Ruysch (*r*) has shewn the possibility of doing this, when he has said that, by means of a liquor wherein he had preserv'd the ribs, and which was made pretty acid, these bones were soften'd to such a degree, that they could be distorted into a spiral figure; just as we would a

(*n*) Prælect. ad Instit. § 401.

(*p*) Obs. 1. § 13, 14.

(*c*) Eph. N. C. Dec. 3. A. 7. & 8. Obs.

(*q*) Obs. 1. § 2. & Schol. ad § 10.

(*r*) Theat. Anat. 6. n. 13.

cord : and this he afterwards confirm'd by macerating others in an acid liquor ; for he could reduce them (s) into the form of the letters C. and P.

And in the second of his *Adversaria* (t) he has asserted, not only that the ribs become soft and flexible, from a similar maceration ; but also that the human bones in general were thus changeable : and, indeed, he has expressly added the following words : “ Does it from hence appear in what manner “ that memorable disease was brought about, wherewith a virgin, in France, “ being affected, had all her bones soften'd down like paste ? ”

But as in those former experiments he has only mention'd the ribs of *infants*, and here, with the same view, the bones of *children* ; you may add to these the bones shewn by Hunauld to the Royal Academy of Sciences at Paris (u), which, being macerated in vinegar, were become soft by that means : and because it does not appear from what bodies these bones had been taken, you may join with them the instances which were related to the same Academy, by the two celebrated men Fauchy and Geoffroy (x), of two ivory spoons ; one of which having been left in milk for a long time, through forgetfulness, and consequently in milk that was become acid, was found to be flexible like leather : the other, which was small, and seen by the Academy itself, had been made flexible, like horn, and pellucid ; after having remain'd a long time in that kind of sauce which we call mustard.

But, to return to vinegar, I would also have you attend to this ; that when those bones which Hunauld shew'd to the Academy, had been soften'd by vinegar, they recover'd their former hardness by being macerated in water ; and, again, lost that hardness in vinegar : and from all these circumstances, and from that I have taken notice of above (y), of aluminous baths, which have restor'd lost firmness to the bones of living men ; you may take a new argument of the various and manifold causes, and also of the various and manifold disorders, whereby the bones may be made flexible : for, certainly, if they had been fleshy, or pultaceous, there could have been no room for any remedy whatever.

And if it were determin'd universally, that the bones in ricketty children were of a waxy flexibility, and Mayow, as you even have it in the *Sepulchretum* (z), did not contend that they are “ rather more firm than in “ others ; ” I should have taken notice of some external remedies here, which are said to have been useful to such patients, and have compar'd them with the experiment of Hunauld.

But as, in order to explain the curvatures of the bones which are in those children, it does not seem absolutely necessary to suppose that waxy softness of the bones ; since it is quite sufficient that they are much less hard than in adults, as that age requires ; so that, by the prevailing force of the muscles, which belong to one surface of the bones, they may be bent to that side, as has been shewn on another occasion (a), where I have also spoken of the skeleton of a young girl propos'd and explain'd by Mery (b) : I, therefore, did

(s) Thes. Max. n. 164. & Thes. Nov. n. 129.
(t) C. 6.

(u) Hist. A. 1742. Obs. de Phys. & c. 7.
(x) Ibid. & Hist. A. 1743. Obs. de Phys. & c. 13.

(y) N. 6.

(z) L. 2. S. 12. in fin.

(a) Epist. 27. n. 33, 34.

(b) Mem. de l'Acad. R. des Sc. A. 1706.

not think that the bones of this young woman, which were so curv'd in the limbs, and the low stature in consequence thereof, had any reference to this subject; notwithstanding similar circumstances to these have happen'd in those persons whose bones I have said were made fleshy or pultaceous; nor yet that the shortness of dwarfs, by reason of their bones being distorted from the rickets, have any relation to the point in question: although I know that not all who are dwarfs are rickety.

For if you can possibly doubt, whether any persons are born with a very short body, and grow very little, and yet have their bones strait, and all their limbs corresponding to each other in proportion; you may be convinc'd even by that last example, which you will read in the history of the Academy that I have commended (c), of a boy who was now five years of age, and yet not longer than two-and-twenty inches.

But now; before we pass on to other things; I choose to add, to those causes which we have spoken of above, of flexibility, and of fragility, in the bones, the following things also. Dominic Gagliardi (d) has suppos'd that the bones are made soft, and consequently fragile, in those bodies, wherein they have happen'd to be naturally less hard than in others: and that they are not of the same hardness in all persons, but more or less hard in different persons, according to the various degree of the coagmentation, and consolidation of the bony juice; which perhaps might be confirm'd from thence, that they much more frequently become soft in women, than in men: and that this bony *gypsum*, as he call'd it, is soften'd, in consequence of its being *alkaline*, by the acids which are thrown into the vessels of the bones; and that from hence it is that persons subject to "rheumatic and arthritic pains, " but particularly to pains from the lues venerea," are also subject to have their bones become soft.

And by these means he, in some measure, led the way to the experiments of those persons, who, as I said just now, affirm'd afterwards, that the bones are soften'd by means of acid liquors. And that it has more than once happen'd to rheumatic and arthritic patients, to have their bones become flexible, we learn from several observations; to which you will also add that of the celebrated Targioni (e), on a woman, in whom the vehemence of arthritic pains had distorted the ossa humerorum, the ulnæ, and radii, into the form of an arch.

But as to the humours being infected with acid particles, in the disorders which Gagliardi has made mention of; as this cannot be prov'd by every one; you will only admit of the argument from him as far as you think proper, and leave the rest undetermin'd.

Moreover, in regard to the fragility of the bones, the celebrated Lovisius (f) shows, that this is not always brought on by a caries. For when he dissected the body of a woman, who had broken the os humeri, and soon after the os femoris also, by a slight effort, he found the bones "not carious, " but dry, and fragile; and the medulla, in like manner, dry, friable, and

(c) A. 1746. Obs. Anat. 8.

(d) Obs. 3. supra ad n. 6. cit.

(e) Prima Raccolta d'Osservaz. Med. nella

Descriz. d'un Tumore Follicul.

(f) Vid. Aët. Erud. A. 1751. M. Jun.

P. 1. ubi de ejus Observationib.

“quite loose from the parietes of the bony cavities.” And this woman was actually sixty years of age; but of a pretty fat habit of body: full of health besides, and alacrity; except that she had already labour’d, for some time, under a cancer of the breasts.

But now take the other history of Valsalva’s that I have promis’d you.

8. A man, who was a native of Bologna, had been afflicted with pains, in consequence of the lues venerea, which return’d every day at a certain period. These pains were very violent at the diaphysis of the tibiæ, and at the ankle-bone at the same time; where a small, and somewhat soft, tumour was perceiv’d by the fingers, and by the eyes. Internal and external remedies being made use of in vain, Valsalva applied the scalpel, and gave the wish’d-for relief.

For having open’d, and laid aside, the common integuments; and taken away a small quantity of yellow jelly, which was interpos’d betwixt those integuments and the subjected tendons, and made up the tumour; the pain in the ancle did not return on the following day.

However, as the patient said that he was prick’d with needles as it were, if the neighbouring tendons were by any means press’d upon; it was easily conceiv’d that some part of that jelly lay hid beneath them: which, at length, being wholly, and dextrously, taken away quite from the very bone, without injuring the tendons, that sense of the pricking of needles vanish’d also.

But the pain in the tibia remain’d, contrary to expectation; for it was suppos’d to be produc’d by consent of parts. The periosteum, therefore, was laid bare by the knife; and was found to be not quite in a natural state: so that it was necessary to procure a separation thereof from the bone, which was in other respects sound. This being done, no pain any longer remain’d: and the wounds being easily brought to a cicatrix, the patient was dismiss’d in good health.

9. When Valsalva related this observation to me; for he did not leave it in writing; I remember him to have added, that other similar tumours, from a venereal cause, had also been cur’d by him in the same manner; so that neither they nor the pains return’d afterwards. And he class’d them among the venereal gummata, as they are call’d; thinking it by no means necessary, that they should all arise under the periosteum, or be comprehended in a peculiar coat.

Nothing is more similar to the observation in question, than that of Fabricius ab Aquapendente (g); which has been already taken notice of by me also; except that the tumour was not at the ankle, but at the wrist, and brought on severe pains every day, at a certain hour: being made up, as he found by dissecting out the tumour, of a small quantity of vitreous pituita, according to the manner of speaking made use of at that time, lying in contact with the internal tendons.

And I suppose that Nicolaus Massa referr’d to a matter of this kind, when, in the carcases of those persons who had been afflicted, while living, with the venereal disease; and he had dissected a great number; he asserted, as you have it in the Sepulchretum (h), that he had found “the painful places to

(g) De Chirurg. Oper. ubi de Articular. Ulc.

(h) Sect. hac IX. Obs. 3. §. 1.

“ be moist with a pituitous matter :” and this Fracastorius (*i*) also ; where he asserted his having found out the cause of the pains which afflict venereal patients by night, from the same lues,” by making a number “ of dissections ;” spoke of under the title “ of a kind of lentor,” which he had seen upon the tendons and muscles : and he has expressly asserted, “ that gummofities are made up of concreted phlegm.”

Nor is it of any importance that Fabricius has not said whether the tumour which he cut out was venereal ; for he acknowledged gummata(*k*) to be frequently, but not always, from that cause.

However, I would rather you should of yourself doubt, whether two anatomists, and at the same time very excellent surgeons, Fabricius and Valsalva, were not themselves also at those times deceiv’d, when both of them suppos’d that the tendons, and the latter of them even that the periosteum, were affected with these pains ; I say, I had rather you would of yourself doubt, than that I should give out the suspicion.

But that gummata are not always seated betwixt the periosteum and the bone ; although you should not digress from this section of the Sepulchretum ; you will naturally conceive : and not only from Rhodius (*l*), who, in this very theatre of ours, saw “ three white gummata” demonstrated by Anthony Molinetti, upon opening the cranium, “ and these gummata adhering to the dura mater ;” but also from Guarinoni (*m*), who asserts, that he “ had seen the gummata spoken of concreted in the brain.”

This situation I mention in particular, because these things are added to this author’s observation, wherein “ three little bodies, like venereal gummata,” are said to have been seen in the brain of a man ; who having been subject to epilepsy, and convulsion, after the lues whereof we are speaking, was, at length, carried off by a very heavy sleep.

And as this cause, and these disorders, are likewise read of in a history which I have written to you some time ago (*n*) ; you may compare them one with another, and consider again, if you please, of what I then left undetermin’d (*o*), in regard to that small and roundish abscess within the cerebrum ; I mean, whether it belong’d to the class of gummata, or not.

And while you are doing this, you will, at the same time, call to mind those gummata of the head, which generally begin under the integuments of the cranium, and erode the bone, unless they are attended to in time ; as the same history shows ; since observations of this kind are here wanting in the Sepulchretum : with which otherwise it might have been encreas’d ; and amongst these with that which the celebrated Heister (*p*) has produc’d, together with the dissection of the body after death.

10. For the two remaining observations of Valsalva, which I have given, I will subjoin as many of my own that remain behind ; beginning with that which is particularly requir’d by the discourse I have begun, upon a caries corroding the cranium. For that this spreads far and wide, unless you pre-

(*i*) De Morb. Contag. l. 2. c. 12.

(*k*) l. cit. ubi de Gummatib.

(*l*) Obf. 1. §. 9.

(*m*) in Schol. ult. ad Additam.

(*n*) Epist. 9. n. 23.

(*o*) n. 24.

(*p*) Dissert. de Off. Tumorib. n. 15.

vent it in time, I have even seen without the dissection of the body, and you will conceive.

11. An old woman, in the hospital of Incurables at Bologna, had so much of the left os sincipitis, and the neighbouring os frontis, consum'd by a venereal caries, that the brain was laid open by a foramen of three fingers breadth in every direction; and you could plainly see, while you felt the artery at the wrist, that this artery and the brain rais'd themselves up, and subsided, at the same point of time.

And lest you should doubt of this, I saw her frequently in that year, which I think was 1700; for the woman did not live there a little time; although the eroding virus was not yet entirely overcome, nor the ulceration, which was external about the edges of the foramen, was drawing on to a cicatrization. But the membrane of the cerebrum itself appear'd to be clean and bright in its colour.

12. It does not escape me that the cranium is consum'd for a much wider space, if the caries goes on, as; to omit others; I have read our Fallopius (q) saying, "that the whole sinciput is sometimes corrupted; and sometimes also a part of the occiput: and at other times that the whole skull is corrupted, and taken away; and this," says he, "I have seen first in my mother's sister, who had receiv'd the lues venerea from her husband: and I took away from her the whole cranium: the membrane is cover'd with a kind of pellicle; and the pulsatile motion of the dura mater is always perceiv'd." And he adds, that "he had many other examples of the same kind, both here, and in other places."

But in that old woman, there was not a manifest pellicle which cover'd the meninges: and the part even appear'd as if the dura mater had been taken off, and we were looking upon the brain when cover'd only with the pia mater, having a reddish, smooth, and moist surface. I could not, therefore, sufficiently admire, how the humour, which had been able to erode the bone, had not injur'd, in the least, that membrane; and how it was that the woman labour'd neither under convulsion, paralysis, nor any other mark of injury in the brain, or its membranes: although whether she had labour'd under these symptoms before, or not, I cannot inform you.

Nor was Hildanus less surpriz'd formerly (r), that no symptoms of injury done to the spinal marrow, were present in a man who had it "laid quite bare, and cover'd over only with its membrane;" whereas three of the bodies of the thoracic vertebræ were destroy'd by the caries.

And, indeed, these things are more surprizing than that the muscles, which lie upon the bones, or the integuments, should, sometimes, not be injur'd by the humour which erodes the subjected bones both internally and externally, without any external tumour, or discolouration betraying the disorder: which circumstance miserably deceives incautious lovers, who are ignorant that under a fair appearance of body, though not disfigur'd in the slightest degree in any part, even the most considerable caries may lie hid; an example of which kind is particularly to be read in Novefius (s), from

(q) Tract. de Ulcer. c. 47.

(r) Cent. 5. Obs. Chir. 56.

(s) Letter 6.]

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whom it might be referr'd into the Sepulchretum, with the approbation even of Guilielmini (1).

When Benivenius (u) formerly propos'd an instance of the os frontis being almost wholly consum'd (but by a caries of another kind, as it is natural to suppose), without any mark being conspicuous externally; he made use of the example of thunder, which sometimes melts gold without injuring the case wherein it is kept; or does other things of the same kind, which Marcellus Donatus (x) adds, when he relates the observation of Benivenius.

But others choose rather to make use of the example of aqua stygia, which destroys iron, for instance, but does not touch suet. You may either devise some other comparison, or follow these authors. For it will not only be of use in the cases in question, but in others also.

So our Fabricius (y), in a boy; Matthæus Blawius (z), in a man; so Jo. Jacob Scheuchzerus (a), in a woman; saw the skull entirely perforated, in more places than one, by a corroding caries; and yet the dura mater unhurt: so as to make it evident, that the acrid and corrosive humour, to use the words of Fabricius, was "contrary to the nature of the bones of the head, but by no means to that of the subjected membrane."

But lest you should suppose this to happen in every caries of the cranium, you may learn the contrary from many observations; and among others from two of Laubius, one on a woman (b), the other on a man (c); in both of whom the cranium was so consum'd, by a caries, to a considerable extent, or perforated thereby, that the corresponding parts, not only of the meninges, but of the cerebrum itself, gave access for the pus, quite to the lateral ventricle, and the right ventricle in both: although in the woman, there at length came on a paralysis of the subjected side; which had already existed for a long time in the man: and, as it is then wont, for the most part, to be, on the left side.

And as I have spoken sufficiently of this difference already, on other occasions; you yourself will consider of the other, which relates to the present subject: that is to say, why the eroding ichor of a caries should vitiate the meninges of some persons, and leave those of others unhurt? Is it because, in the last-mention'd cases, it has a free discharge outwards; and in the former has not? Or, because in the latter it is infected with a venereal virulency; and is not in the former?

But as cases are not wanting to be repugnant to either one or the other of these explanations; as to the first, that which has been propos'd by Blawius, in a man; as to the second, that which has been propos'd by me, in a woman; you are certainly under a necessity, at other times, of accounting for it from some certain nature and disposition of the ichor, and the bodies affected therewith. But I go on to my other observation, such as it is.

13. A butcher, of forty years of age, who was infected with a venereal lues, and frequently intoxicated with wine, had been, for a long time,

(1) Reponse 6.

(u) De abdit. &c. Morbor. causis c. 18.

(x) Medic. Hist. Mirab. l. 5. c. 1.

(y) De Chirurg. Oper. ubi de Gummatib.

in fin.

(z) Eph. N. C. Dec. 3. A. 7. Obs. 151.

(a) Act. N. C. Tom. 7. Obs. 47.

(b) Eph. cit. Cent. 8. Obs. 21.

(c) Earund. Cent. 9. Obs. 14.

subject to disorders of the thorax, and had been in this hospital, on that account, at other times. Last of all, returning into the same hospital, besides an acute fever, on account of which blood had been twice taken away, (which neither the first nor the second time was without a polypous crust) he was afflicted with a continual cough, which attack'd him so violently three or four times every hour, that he became livid therefrom: he expectorated purulent matter: and had a vibrating pulse.

Having been thus affected about fifteen days; last of all, his strength decreasing more and more, within one day, he ceas'd to live about the end of January, in the year 1747.

The body; if you except some parts of the thorax; I had not in my power to examine at that time, being taken up with other things relative to the public demonstrations of anatomy, The lungs were half-rotten, and smelt very strong. The heart was lax. In one of the valves of the great artery, the corpusculum Arantii was much larger than it naturally is. And under it, on that surface where the valve was turn'd towards its fellows, the membranous laminæ, of which it was compos'd, were so disjoin'd to a considerable tract, that where they open'd I could introduce a probe betwixt both. And the neighbouring trunk of the artery was distinguish'd, here and there, internally, with whitish spots: nor was it very smooth, but even somewhat unequal. And, soon after, being distended into an aneurism of the curvature; I was, for this reason, less surpriz'd, as I have said heretofore (*d*), at what I observ'd in that valve.

14. Although, for the reason just now mention'd, I could not sufficiently compleat this observation; yet I was willing, however, not to pass it by, that you may join it with the others referr'd to in the beginning of this letter (*e*); whereby we have shewn, that the lungs are frequently injur'd in a lues venerea; and that the great artery is sometimes injur'd from the same cause, and dilated into an aneurism.

Perhaps, we should also have found the kidneys to be diseas'd in that man. For these four parts, the lungs, the aorta, and the kidneys, together with their appendages, we have found to be injur'd; in those who have labour'd considerably, and for a long time, under this lues; somewhat more frequently than you will easily imagine from the reading of most books.

But as to that viscus, which very learned men had formerly said was affected more than others, and indeed was the seat of this lues, as you see from the Sepulchretum (*f*); to which, however, others do not assent, as you will learn from the same book (*g*); I mean the liver; I do not, at present, remember that it ever appear'd to me to be vitiated in these bodies.

Yet I shall not for this reason deny, that those things which happen rarely, or never, to me, might not have happen'd frequently to others; or, on the contrary, that those things which happen frequently to me, might not have happen'd rarely to others: for I mean nothing else here but to inform you what I have happen'd to meet with the most frequently; as I very well

(*d*) Epist. 27. n. 7.
(*e*) N. 2.

(*f*) Obs. 2. § 1, 2, 3.
(*g*) Ibid. § 4, 5. & Obs. 4.

know, that this lues, since it may sometimes lie hid under the mask of any disease whatever, may also vitiate any viscus whatever.

But what viscera it really affects more frequently, or what less frequently, you cannot easily determine, before many observations of different persons are compar'd together. Yet I cannot help being surpriz'd, that, as so many are infected with this disease, and so many die, the dissections by no means correspond to their number. And, certainly, you will not see a great number transferr'd into this section of the Sepulchretum.

The section, therefore, is short; and so much the shorter still, because the whole of it is not of the lues venerea, but also of the *plica polonica*: and where it is upon that subject, it consists in great part of scholia, one of which is not even found in its proper place; as, for instance, that which is affix'd in the third place to the first article of the first observation, wherein there is nothing of "tumid and suppurated bones;" whereas it belongs, as far as I can judge, to the eleventh article, which is three pages distant from thence: and almost all the scholia are from Sylvius; who endeavours to build up his theory of the acid nature of this poison; out of which some things might have been omitted, and others have been substituted in their places: as, for instance, when he has conjectur'd (*b*), that bubos arise in the inguinal glands, because "they are near to the spermatic vessels."

They judg'd better, who said formerly with Brasavolus (*i*), "that a kind of deprav'd quality ascended, by the penis, to the emunctories, and to the glandular parts of the groins; and excited bubos there." For although they did not point out the way which led into these glands; they did not, however, propose a passage which did not lead thereto.

What passages can lead to these glands, finally, William Cowper shew'd six years before the Sepulchretum came out with its Additamenta; among which this ought to have been put, as you have read in our Adversaria (*k*), where we have transferr'd the same conjecture to women also: and have made use thereof, since that time, in consultations where the question was of bubos, that had succeeded to erosions of the glans and præputium, degenerating into deep cancerous ulcers; as I have more than once seen.

Yet remarks are not wanting in these scholia that seem to be owing to dissections; as that (*l*) of the venereal infection arising from the loculi of women, "quite to the cornua uteri, corrupting them, and exciting ulcers there:" which exceedingly well agrees with the observation of our Vallisneri (*m*) on a woman, in whom, in consequence of the same lues, not only all the loculi, but the whole right tube also, was ulcerated.

By those appearances that have been seen by Vallisneri in the viscera of women, and by Genselius (*n*), by Salzmann (*o*), by Caspartus (*p*), by Pet-schius (*q*), and by others, in the viscera of men also, and in other parts of those persons who had died after this disease, you may increase the number

(*b*) Schol. ult. ad § 4. Obs. 1.

(*i*) L. de Morbo Gall. ubi de Caus.

(*k*) IV. Animad. 22. & 27.

(*l*) Ad § 4. cit. Schol. 1.

(*m*) Ist. della Generaz. P. 2. c. 5. n. 21.

(*n*) Eph. N. C. Cent. 6. Obs. 84.

(*o*) Act. N. C. Tom. 2. Obs. 99.

(*p*) Dissert. de Exost. cran. § 8. ubi num Aortæ aneurisma.

(*q*) Syllog. Anat. Obs. § 87.

(which,

(which, as I have already said, is not very large) of observations that are contain'd in this section of the Sepulchretum.

15. Nor does it escape me, that a book has been publish'd, in our age, "on the diseases of the pudenda, and the lues venerea;" wherein you have many observations, relative thereto, made even upon dead bodies. But whether these might, as well as those just now spoken of, be referr'd into the Sepulchretum, I do not very well know. Yet I do not say this because I doubt the author's veracity, but because I do not know how far his eyes, and his diligence, are to be depended upon.

For there are some things that he has affirm'd he had seen in other writings, which others believe he had seem'd to himself to see, though they themselves could never see them. And things of this kind are not wanting in his book; as, for instance, when he says that the *uterus* is *interpos'd* betwixt the *intestinum rectum* and the *lacunæ* of the *vagina*: that the *peritonæum* *rises up and is superextended* upon the *inguinal glands* on the external part, that is betwixt them and the *skin*: that the *lymph* is *carried by the lymphatics of the mesentery to the glands of Peyerus, that is, to the intestinal glands*: that the *pancreas Afellii* is in the human *mesentery* also; for he says that, in those who have died of a *lues venerea*, *the pancreas of Afellius is reduc'd to nothing*: and other things of a similar kind, which I purposely pass over.

And at the same time that he sees those things which others do not see, he, on the other hand, does not see, or does not know, what others see and know; as, for instance, when he writes, that in the *vesiculæ seminales* *nothing anfractuans or contorted is contain'd, by means of which some delay to the semen may be pretended*: or where he says, *of a mucous body betwixt the cuticle and the skin, I find no mention made among anatomists, except those of Montpellier*: and to this, moreover, *Polfenus first attributed the colours of the skin, but, in particular, the blackness of the Ethiopians*.

But he, who does not seem to have read *Malpighi* (r), and others after him, who teach the same things, takes a great deal of pains in producing authorities from many writers, both medical and not medical, to persuade us to embrace an opinion which has been confuted by a much greater number of authorities; I mean, that the *lues venerea* is a very ancient disease, and, finally, nothing more than the *elephantiasis*.

This I suppose he would never have attempted to prove, if he had then had it in his power to read that very learned and able physician *John Astruc* (s), by whom these persuasions are entirely rooted out; although this, however, is surprizing, that he, who was not ignorant how great, and how immoderate a mixture of nations there was formerly in the Roman stews, while the power of the *Cæsars* was at its height, should have suppos'd that there was the same *lues* at that time; but divided by physicians into many disorders, and not consider'd as one disorder, before "a collection of them" all was observ'd "in the camp at Naples:" as if there had been a greater mixture of nations in those camps than formerly at Rome, where one and the same harlot (as *Martial* (t) confesses in so many words) prostituted

(r) De Ext. Tract. Organo.

(s) De Morb. Vener. l. 1. c. 1. & seqq.

(t) L. 7. Epigr. 29.

herself to Catti, to Germans, to Dacians, to Cilicians, to Cappadocians, to Indians, to Jews, &c.

The American nation was the only one then wanting at Rome: and in these camps were not wanting such as had commerce therewith themselves, or, at least, by means of others; so that it may be easily conceiv'd from whence, not a new collection of diseases, but the lues itself, came into Europe.

And you may not only observe a great negligence in these things, but also in the enumeration of the years from that time; which is in other respects very easy; and in the reading of the best physicians from thence quite down to the present age; where it is soon after said, that the lues venerea "had already lasted, under this title, more than three hundred years, and had even remitted nothing of its atrocity;" since it is certain to every one, that this Neapolitan war had not begun before the year 1494: and by the author whom I have before quoted, I mean Astruc (*u*), so many authors are produc'd; and, amongst these, some who, as they were celebrated physicians, so their writings are in the hands of almost every one: by the testimony of whom it is very evident, that this disorder is become more slight.

After these remarks, and others which for brevity's sake I omit; and, amongst these, that next prognostic aphorism, "a fever, succeeding to a lues venerea, solves the disease;" I would have you yourself consider, whether we can ascribe so much to his eyes, and to his diligence, as to admit of all his observations without any the least doubt or hesitation.

16. Do not, however, imagine that these things are said by me for any other reason than from a desire after truth: as they are of an author who was not known to me while he was living, either on the score of injuries or benefits; and in whose book I do not deny that there are also some good things. But do not ask me, whether in that method, likewise, whereby he taught that this disease is to be overcome.

For from the time that this disease was known to physicians, that different methods of cure have been us'd by different persons, and what had been formerly made use of has been deserted in the same places, and that which had been exploded substituted in its room, in this disease more than in any other, I suppose no body can be ignorant; so that, if you approve of any thing in preference to others, or disapprove any thing, it is to be fear'd that, on the contrary, others may disapprove or approve it: and not only of those who are to come after us, but of those who are living at present, in so great a mutability and diversity of opinions.

For in regard to the two most celebrated remedies against this disorder, the decoction of the woods, as it is call'd, and quicksilver, how many dissensions and different opinions do still subsist? and not only which is to be preferr'd to the other, but, if you prefer one to the other, in what manner this is to be made use of.

It is certain, that, in the very beginning of this disorder, the mercurial unctions were applied: and, afterwards, that the decoctions of the woods

were preferr'd to them : and that mercury was again made use of internally ; and yet that the decoctions of the woods had not, for this reason, become so exploded, as not to be still had recourse to in some cities in particular : nay, these only were preserv'd, and both the methods of using mercury rejected entirely ; till, at length, in the same cities, they again return'd to one or the other method of using mercury, where a very violent lues did not yield to the decoction.

I remember, when I was quite a young man, and went to Bologna, that both methods of applying mercury were so far deserted, that I never saw any physician make use of it ; or even heard of his using it (for the whole space of eight years, during which I studied physic there) in either one or the other way ; and that was very surprizing in the city where Jacobus Berengarius Carpenfis had formerly flourish'd, and had been fam'd for the use of mercurial unctions, which he was one of the first promoters of, if not, as most authors imagine, the first inventor : certainly if he was born some years before 1467, as that passage of his, which has been produc'd by me in a former work (x), seems to show ; he was of such an age, when the lues venerea was first known in Europe, that he may be suppos'd to have made use of this method in the very beginning.

But how much mercury had not only begun to be suspected, but to be very rarely applied, at Bologna, before I went to reside there ; to omit some of the more ancient of the Bononian writers ; sufficiently appears from the *Empirica Rationalis* of Claudinus (y), where he speaks of both these methods of using mercury : and not only of the fumigations thereof, which are very frequently pernicious ; and therefore not so much as mention'd by me at present.

What remedies then, have you seen those very excellent physicians make use of, you will say, against the lues venerea ? Why the decoction of woods, either in the common method of giving them ; and this for the most part ; or in another way, wherein I have seen them us'd by Valsalva, and that frequently.

For having observ'd some persons to take in a great quantity of that decoction which they call *Aqua Stibiata*, or *Aqua Corfi*, with success ; he said, that it came into his mind to make use thereof, in the same manner that we generally make use of bath-waters. That he had therefore given it, at first, to the quantity of two or three pints, and observ'd whether it was easily discharg'd, and by the way of the bladder ; not through the intestines, or the skin, as it sometimes is. For if it was not easily discharg'd, or if by these two last-mention'd ways, that he desisted. But if it pass'd off easily, and only by the urinary passages, that on the following day he had encreas'd the quantity, and so on more and more, till it came to ten pints. And that by this means he had gain'd great advantages in a little time ; so that sometimes, within not more than three days, he had seen old ulcers heal'd, and gum-mata depress'd ; as in a certain knight, for instance, whom he particularly mention'd to me.

(x) Epist. Anat. 6. n. 2. in fin.

(y) l. 6. S. 2. tr. 1. c. 3.

And certainly by this method of cure I myself saw a woman made perfectly well, who had suffer'd, for the space of two years, under venereal ulcers; one that was very large in her knee, and three or four in her palate, which were small ones indeed, but such, nevertheless, as suffer'd the aliments to pass from the mouth into the nostrils, to the very great inconvenience of the patient: and I saw, in like manner, a gentleman, a fellow-citizen of mine, cur'd thereby, in whom, from the same cause, the hypogastrium and the thighs were cover'd with foul ulcers, to a very considerable extent.

And as this happen'd in the few days of drinking these decoctions, I could wish those persons to have been present, who, by reason of the very quick discharge of a great quantity of bath-waters, by the bladder, have imagin'd to themselves certain passages, whereby these waters might descend into the bladder, without mixing and circulating with the blood; for unless this decoction had been circulated with the blood, and carried to all parts of the body, it could not so soon have heal'd those parts that were ulcerated, or otherwise diseas'd.

However, the same thing that came into the mind of Valsalva, in regard to the use of a stibiated water of that kind, had formerly come into the mind of Johannes Manardus (z), in regard to the decoction of guaiacum; for he says, “ Among the various uses of this wood, I most approve of that
“ method wherein the decoction of it is drunk, in the manner of medicated
“ waters, or whey spoken of by Dioscorides. For from thence comes the
“ manner of drinking medicated waters, which is made use of among the
“ Italians in general; that is to say, of drinking four or five pints at in-
“ tervals.”

And this method of using the decoction is so far approv'd by our Massaria (a), that he wonder'd how it could happen, that nobody, quite to his time, had follow'd “ so clear and excellent a practice of so illustrious a
“ man:” and he asserted, that he had made use of this method, more than once, “ with the greatest facility, and the greatest success;” so that the patients “ obtain'd, without much trouble, and in a few days, the good ef-
“ fects which others are scarcely wont to obtain after a great deal of uneasi-
“ nefs, and a very long course of time:” and yet it did not seem to him; as you will find by reading over the passage; of any importance which of the three discharges, that I just now spoke of, was the consequence.

But to return to my former subject; from the time that I resided at Bologna to this time; that is to say, in the space of almost four-and-fifty years; mercury was also again brought into the class of antivenereal remedies, in that city.

17. And I have observ'd, in a not much less space of time, some vicissitude in these remedies, in this city; though not so great a one. For as among physicians, in other respects very skilful, some were never wanting there that lov'd the stronger remedies, rather than the more safe; so I have heard, that though almost any method whatever of using mercury was, for the most part, far less esteem'd than the decoctions, it nevertheless was at no time deserted.

(z) l. 14. Epist. Medic. 4.

(a) Pract. Medic. l. 6.

From the time therefore that I came hither, except suffumigations, mention of which I do not ever remember to have heard, I know that most other methods of using mercury have been practis'd; and amongst these, even that of giving it internally: and this either join'd with such things as open the bowels, or so prepar'd, as to bring on a salivation, or even a diaphoresis: or of smearing it upon the skin, when mix'd up into the form of an ointment.

This last method, however, was more rarely us'd, and the three last not very commonly; but the decoction of woods very frequently: and these were, for the most part, prepar'd from exotic woods; and sometimes, as for instance, for the poorest patients, from our own plants; on which occasion I must not conceal from you what Vallisneri asserted to me: I mean, that having prescrib'd to a poor man who had labour'd under a most violent lues venerea, for a long time together, a decoction of the roots of bardana, horehound, and the green husks of walnuts, great sweats were brought on, and the man was perfectly cur'd.

Moreover, I have seen things chang'd gradually, and slowly, in such a manner, that unless the disease is very slight, decoctions are very rarely given to excite sweat, but mercury is very frequently given to excite a salivation; unctions being almost deserted: for the physicians alledge against these, that by this method they do not well know how great a quantity of quicksilver may enter the body, and for that reason are ignorant how it is necessary to proportion their applications.

And I wish to God, the present method of cure also made use of here, had never brought with it those violent, and sometimes fatal, disadvantages, which I know not what extollers thereof conceal, and smother, among certain fictitious positions, and exaggerated narrations, of theirs; and that it was, for this reason, to be preferr'd to all others.

But considering what has happen'd in former times, and what now happens, and what begins to happen here again, they cannot but soon expect new vicissitudes here also.

Not only the method of taking quicksilver internally, but the efficacy of certain properties thereof, (against this disorder) which was not unknown to the professors at Padua formerly, if they had escap'd the memory of the less learned practitioners; may without doubt again be forgotten: that is, when a different method of cure, and a different mode of explication, have prevail'd among most persons.

And I do not think that you will enquire what professors those were, as I know that, to mention no others, you have read Falloppius (*b*), Tomitanus (*c*), and Saxonia (*d*): the last of whom describes mercury as exhibited in more ways than one; that is with cathartics, and without them, "so as to excite a copious spitting in some persons:" and relates that this remedy was then us'd by a very celebrated professor, and physician, at Padua, Albertini Bottoni.

(*b*) Traët. de Morbo Gall. c. 79.

(*c*) De Morbo Gall. l. 2. c. 15.

(*d*) Traët. de lue Vener. c. 22.

Nor is it to be doubted, but those who succeeded afterwards in this college; though they did not make use of that precipitated mercury which Bottoni did; either us'd themselves this sublimate which is at present us'd, when properly dulcified; or at least extremely well knew, from many books which were publish'd, that this had been propos'd by physicians of eminence in order to excite a salivation.

And the efficacy of some of the properties of mercury, against this lues, was not entirely unknown by two at least of our ancient professors, Hieronymus Fracastorius, and Benedictus Victorius; for the latter of these, though pass'd over by Papadopolus, is shown to have taught here before the middle of the sixteenth century, by Tomafini (*e*); and the former, though omitted by Tomafini, Papadopolus (*f*) proves to have been a professor at Padua, in the beginning of the same century. Of quicksilver, therefore, thus Fracastorius (*g*):

*Quodque est condensum, humores dissolvit, agitque
Fortius; &c.*

“As it is of a very dense nature, it dissolves the humours, and acts
“very powerfully; &c.”

And Victorius thus (*h*): “By its gravity it penetrates the skin of the
“body, being, by some means, actuated by the heat of the body: and
“soon after also, when it has enter'd the body, mention is made of its
“gravity.”

18. I pass by other things that our Tomitanus (*i*) took notice of, as if from other persons, in regard to “the very slender, the very small, the
“minute particles” of which mercury consists; that I may subjoin the observation and the *consilium* of our Trincavelli (*k*) likewise, which relates to the disease in question, and at the same time to these baths of the ancient Aponus.

Being consulted for a noble matron; who had this lues join'd to many other disorders; after having propos'd other things, and come to two which seem'd to be capable of being particularly useful, the decoction of guaiacum-wood, and the bath waters; and having answer'd that the former was likely to be useful, not only against the lues, but against the other disorders also; when he goes on to speak of the waters, and their manifold use by drinking, washing, and receiving them on the body, when dripping from a pretty high place, he says; the other disorders indeed, and the causes of them, “we
“may hope they will perfectly overcome: but as far as relates to this lues
“venerea, or gallica, I should believe they would be of very little or no
“service to that: nay, if I must confess the truth, I think I have observ'd,
“that they are generally rather hurtful, to those who labour under this
“disorder, than advantageous.”

(*e*) Gymn. Patav. l. 3. c. 8. ad A. 1532.

(*h*) l. de Morbo Gall. c. 7.

(*i*) c. 15. paulo ante cit.

(*k*) l. 2. Consil. Medic. 63.

(*f*) Hist. Gym. Patav. l. 3. S. 2. c. 11.

n. 55.

(*g*) Siphil. l. 2.

Is not this an observation modestly propos'd? The consilium follows:
 "But at length, to open to you the whole of my sentiments in this affair: I
 "would make use of both remedies: and would first try the decoction of
 "the wood; and afterwards would have her brought to Padua to the
 "baths." In this manner then, even in the year 1561, did the Paduan
 professors observe. And thus did they answer to those who consulted
 them.

And if any persons, less conversant in their monuments, are perhaps ignorant of that; they will not, therefore, pour darkness and shades upon the glory of their predecessors, as if they had confirm'd it by no observation, and especially by so easy a one. And indeed, that which is added to this section of the Sepulchretum, from the consultation of Guarinoni, does not seem to differ from those things which Trincavelli had remark'd.

Nor do they differ, certainly, which Andrew Bacci (*l*), a very celebrated writer upon warm baths, has said. For although he judges, that not all warm baths are noxious in this disorder (in which we must certainly give credit to his experience, and that of others, even modern, and very famous men), he expressly affirms that the Aponian baths are injurious; and he even says, "I know that the same thing has happen'd to a certain illustrious prince, at the Aponian baths; I mean, that he, unmindful of his past venereal contagion, brought back upon him his old pains, from the use of the baths."

Perhaps, likewise, you would not imagine any thing foreign to probability, if, to the other causes for which that very great concourse of patients to the Euganean baths, near Verona; that had continu'd down from the most ancient times, has now decreas'd; you should also add this; that they must not only have ceas'd to be useful to a great number, but have been injurious, in proportion as the number of men who are affected with the venereal disease, among others, either openly, or occultly, is increas'd.

But if this disease, as it was imported into Europe, should, at length, at any time, as Fracastorius (*m*) hop'd, entirely be driven therefrom; and physicians should not be wanting at that time, who might be adorn'd with great, but with just praises; I have scarcely any doubt, but the reputation of the Aponian baths; which is at present much diminish'd, indeed, for other reasons, but, on the score of their admirable properties, was never wholly lost; would again become far different from what it is in the present age, and what it will probably be for some considerable lengths of succeeding time: unless the singular skill of two friends, whom you know, in enquiring into the nature of these fountains, and their diligence in observing and publishing their effects, should, by holding up the successful instances of their use before the eyes of all mankind, allure, with a kind of new invitation, a much greater number of patients to seek health for themselves in these places.

19. Now since the love of truth has impell'd me to show what ought to be restor'd to the ancient teachers of this college, neither will I conceal this which relates to the controversy spoken of above (*n*); I mean, that they

(*l*) De Therm. l. 3. c. 2. in fin.

(*m*) De Morb. Contag. l. 2. c. 12.

(*n*) n. 15.

thought the same in regard to the novelty of the lues venerea, as most other learned men have thought: and that they denied its being known to Hippocrates, Galen, and Avicenna, with so much the greater authority, as they were more conversant in their writings than some of their successors, to whom it has seem'd differently; and, amongst these, to that otherwise very learned man Carolus Patinus.

For this author, in the beginning of the scholastic year 1687, in order to open the exercises of his office "by this paradox;" I make use of his own words (*o*); made and publish'd an oration with this title, "That the lues venerea is not a new disorder;" in which, however, the celebrated Astruc would have found nothing that had not been sufficiently refuted by him, or might not be sufficiently refuted in the same manner.

But this author imagin'd that oration never to have existed (*p*), for this reason, that Papadopolus had made no mention of it in the history of our college, where, speaking pretty much at large of Patin (*q*), he has enumerated, in a particular manner, his works.

As to Papadopolus, however, who was a very learned man, and deserv'd very well of this college; as he had not sufficient time for writing, proportionably to the multiplicity of his matter, and the largeness of his work; it is not surprising if he, undesignedly, pass'd over some things both in the lives of the professors and of the pupils, and particularly in enumerating their lucubrations; of which he has told us, in his preface, "that he has added the best catalogue he could procure, under each of their names."

I, then, as to what relates to the teachers of the several arts in particular, will not omit to supply the defect of his writings in some measure, as occasion shall offer itself: and this so much the more easily in regard to Patin, because there are, among our books, two volumes in which he has dispos'd his own opuscula nearly in that order wherein they were publish'd; and most of them corrected and increas'd, by his own hand, in the manner he intended they should have been once more publish'd.

What Papadopolus, therefore, has omitted in the first volume, are the following works: "That a physician and surgeon may, without any disgrace to his art, attend to the cure of beasts: an oration.---On the phœnix impress'd upon the coin of the emperor Antoninus Caracalla: an epistle.---An oration on the city of Vienna being set at liberty:" which two are written in the name of his daughters.---"That practical medicine is not enough esteem'd: an oration.---That a physician ought to be ΠΟΛΥΜΑΘΗΣ, or very learned: an oration.---A commentary upon three Greek inscriptions lately brought from Smyrna.---ΕΡΩΤΗΜΑΤΑ ΙΑΤΡΙΚΑ, or medical questions, in regard to the physician.---Philosophical and medical theorems upon life and death.---That the circulation of the blood was known to the ancients: an oration.---The flowers of theoretic medicine.---Public exercitations on fevers;" that is to say, not an oration, as Papadopolus was willing to prove, but a synopsis of the lectures that he was to give.

(*c*) Pag. penult.

(*p*) De Morb. Vener. l. 8. S. 17. ad A. 1687.

(*q*) S. 2. *supra*. ad n. 17. cit. c. 35. n. 159.

And out of the other volume are omitted the following works : “ Political theses on liberty and slavery.---Medical opinions upon fevers.---The idea of the human head : an oration.--An oration deliver’d in the Dodo-næan academy at Venice.---The flowers of practical medicine.---That the lues venerea is not a new disorder : an oration.---Public exercitations upon particular diseases of the thorax and abdomen.---A commentary upon an ancient monument of Marcellina, lately brought from Greece.---That in the cure of fevers, the urine ought to be attended to : an oration.---A commentary upon the ancient honorary sepulchre of Marcus Artorius, physician of Augustus Cæsar.---Public exercitations on the diseases of the head.---An oration upon specific remedies.----Medical and chirurgical flowers.”

• Why Patinus did not interpose betwixt these two last writings, as the order of publication requir’d, an oration which I have by me in a separate state, intitled, “ Vain astrology altogether unworthy of the physician ;” and which he had deliver’d here, committed to the press, and afterwards publish’d ; I no more know, than why the two volumes of opuscula, whereof I have spoken, were left so neglected by him, that, unless they had come into my hands, little papers might easily have been dropp’d and lost ; for such papers he had inserted, here and there, in great number ; without being connected by means of any paste or glue ; which, besides amending some things in these opuscula, exceedingly well illustrate and much increase others.

These papers, however, have been now accurately read over by me, and collated ; and each fasten’d by glue to its proper place whereto it belong’d : so that these writings may very easily be brought out again in a second edition, as the intention of their very learned author had been, either by me, if I should at any time have sufficient leisure, or by others.

And these papers relate to the commentaries I have mention’d, some upon the sepulchre of Marcus Artorius, a greater number upon the first and second of the three inscriptions from Smyrna, and a very great number upon the monument of Marcellina. To which last is added a manuscript epistle, and not a very short one, sent by that famous man Gilbertus Cuperus to Patinus ; which, if I am capable of judging, is worthy of them both.

Nor do I doubt but Patinus intended to have publish’d this also, as he had laid it amongst his papers ; if an aneurism of the great artery, by which I suppose him to have been kill’d, rather than by the polypus concreted within it, as is generally the case (*r*), had not prevented his design.

If this had been done, that very learned man would have shewn how much more capable he was of explaining ancient coins and monuments, than of confirming that medical paradox of the antiquity of the lues venerea, by passages from Avicenna and Galen ; and even, with divine permission, from passages of Hippocrates himself. Farewel.

(*r*) Vid. *Paſſ. Epiſt. de Cordis polypo in dub. revoc. n. 5.*

LETTER the FIFTY-NINTH

Treats of Diseases that are brought on by Poison.

1. **T**HE tenth section that succeeds in the Sepulchretum relates, partly to occult and chronical diseases, and partly to those that are brought on by means of poison. But there is much more utility in speaking of the latter than of the former, on this occasion. For the former are put down, each by its observator, either with no signs at all, or with some only: if with no signs, you can scarcely reap any advantage from the dissection subjoin'd; but if they have any symptom adjoin'd; as, for instance, a fever, a vomiting, a difficult respiration, or any thing of that kind; they certainly might have been transferr'd, with much more advantage, into those sections wherein these symptoms are each of them treated with particular regard.

And as this is done in respect to some observations referr'd to in this section, so it ought to have been done in respect to others; as it might with very great propriety. You see, then, why in this part I do not follow the Sepulchretum, and even why I cannot follow it, as I have thrown the observations of this kind, every one in their proper places, into other letters.

2. But in the other part, which relates to poisons, I shall readily follow it: and will immediately communicate to you a few examples that have been observ'd by me, (for from Valsalva I have none) or by our Mediavia. This first is Mediavia's.

3. A woman, of sixty years of age, having just din'd, ate up some little rolls of almond-paste, which were laid in a by-place in the upper part of the house: this she did unknown to her master, who had laid them there

Scarcely had an hour pass'd but she began to be seiz'd with a kind of sensation in the stomach, as if she were troubled with flatus. And this continuing a very long time, and after that growing more and more violent, she both vomited up, and discharg'd by stool, a great quantity of matter; and by these means she seem'd to be eas'd.

But soon after, a more violent uneasiness returning, and not without fainting-fits, she at length confess'd what she had eaten; but this confession was too late. For these rolls of paste, having been prepar'd in order to kill mice, had arsenic mix'd with them.

Within twelve hours, therefore, after she had eaten them, being rather depress'd in her strength, than affected with very sharp pains, or evident convulsions,

vulsions, this miserable old woman died; and thereby suffer'd for the childish curiosity of her appetite.

The body was examin'd, and dissected, on the following day, by public authority. This was about the 7th of May, in the year 1727. The posterior surface of the body, not excepting even the calves of the legs and the heels, were universally black. The body itself was not rigid. The belly was not tumid: and this cavity and the stomach being open'd, the internal surface thereof was eroded here and there, especially at the antrum pylori: the arsenic itself being seen to adhere to the eroded parts betwixt the little pieces of membranes. Nor was the duodenum free from erosions.

In the thorax, the lungs were blackish: in the heart were two polypous concretions of the shape and length of a finger; whereas, otherwise, the blood was found to be fluid, and of a lively red colour, in all the vessels.

4. As in other disorders, so also in diseases which arise from poison, neither the symptoms, nor the effects, can be expected to be entirely the same in all persons. For in different bodies are different constitutions, both of the fluid and solid parts; especially those that relate to the stomach: and, besides, the emptiness or fulness of that viscus, and these from aliments of different kinds, may be the cause why poisons, although the same, and really of the same weight, (for they may be the same in name, but differently prepar'd) do not, nevertheless, discover themselves by the same signs and effects.

Arsenic, for instance, by which word we mean that which is white, and is frequently join'd with the adjunct of chrySTALLINE, is itself, as those very learned men Mead (*a*) and Boerhaave (*b*) affirm, factitious; and, therefore, may be differently prepar'd by different persons; so that, although you read in the works of Mead, that it is wholly soluble in water, you may read in other authors, not only that its particles were observ'd in the stomach; as in the woman in question; but were also known to be arsenic from hence, that little pieces of it had remain'd in warm water, like white little stones: as you have it in the history of Wepfer, which is the first in observation the thirteenth, among the additamenta to this section of the Sepulchretum.

This history speaks of a little boy of two years of age, who had been emaciated by preceding fevers; and two almost adult girls, who were in very good health; the former of whom had taken but two spoon-fuls, and the two latter the remainder, of a pudding in which arsenic was mix'd, the one with an empty stomach, the other two with stomachs full of meat: the first did not vomit: the others vomited frequently, and in a large quantity afterwards, being assisted by remedies.

These differences were attended with different events. The girls escap'd. But the little boy, in whom no convulsions were observ'd, among the other symptoms, had his strength decrease more and more till he died, the stomach being internally ulcerated; and the lungs of a black colour degenerating into lividness.

In the same place you will see other examples produc'd of children, who, having vomited immediately, or not many hours, after having swallow'd ar-

(*a*) Expof. mechan. Venenor. Tent. 4.

(*b*) Element. Chem. Tom. 2. P. 2. ubi de Sulph.

fenic, and being assisted by remedies, recover'd, Among the symptoms, a tremor of the limbs is mention'd in one (*c*). But a boy who had lick'd up arsenical paint, or red arsenic (*d*), and who was nine years of age, and had not made use of medicines till after the fourth day, is said to have perish'd in convulsions.

Nor are the terrible convulsions which preceded the death of a girl (*e*), who vomited very late after taking, as they suspected, a corrosive poison, omitted. A boy, of four years of age (*f*), and his little sister, who was somewhat more than a year old, both of whom vomited pretty early, escap'd; convulsions being observ'd in the latter, but not in the former.

But in these also the poison, which was in other respects corrosive, was to all appearance unknown; as also that in a woman (*g*), in regard to whom those convulsions are not observ'd; and who, if you attend to nothing else but that she threw up blood by the mouth, might seem to have died of sublimate mercury: since not only Ardoynus (*h*) has spoken of vomiting of blood as being one of the first symptoms of this poison, but Wepfer also, in the fourteenth observation (*i*), saw both bloody vomitings and bloody stools (which even Ardoynus has not omitted) in a dog, that he has expressly said had never been convuls'd, nor had its limbs rigid after death; but had its intestines and stomach inflam'd, as that woman had in part, both internally and externally, and the blood no-where concreted, either in the heart or in any of the vessels.

And this I have hinted at, without being ignorant how much the celebrated Mead (*k*), who saw globules in arsenic like to those in quicksilver, thinks that these agree with sublimate mercury in their manner of becoming deleterious.

But let us return to those things, moreover, that are added in regard to arsenic itself, in the thirteenth observation before-mention'd. What happen'd to two dogs after eating arsenic is scarcely said (*l*), except that they died: yet in their bodies after death, how far the stomachs of both of them were inflam'd; and the coats of that viscus extenuated in one of them, the intestines eroded and perforated, and that in the cavity thereof was black and grumous blood; is not omitted.

Finally, it is also said (*m*), that mountebanks and jugglers swallow down arsenic into stomachs full of fat and oily substances, without any mischief ensuing, as they soon after vomit it up privately; but that they perish, if they are oblig'd, contrary to their custom, to defer vomiting. But all these things are contain'd in the additamenta; where this also is said: that a cat (*n*) which had been made very ill by arsenic, having a vomiting brought on by a little piece of tobacco being thrust in with his food, recover'd thereby.

And in this section itself, that observation is particularly to be attended

(*c*) Hist. 2.

(*d*) Hist. 8.

(*i*) Hist. 2.

(*k*) Tentam. cit.

(*e*) Hist. 9.

(*f*) Hist. 10.

(*l*) Hist. 12.

(*g*) Hist. 11.

(*m*) Vid. etiam Schol. ad Obs. 3.

(*h*) De Venen. l. 2. c. 5.

(*n*) In cod. Schol.

to (o) which confirms what has been just now asserted. That is to say, a dish came on, in the last course, wherein arsenic had been mix'd instead of flour; and the guests, who had as yet eaten and drunk very little, were carried off immediately after taking the poison: but they who had distended the stomach with food, and with drink, were cur'd by means of vomiting; yet with this circumstance, that in their bodies after death (notwithstanding they did not die till many years afterwards) there appear'd marks of erosions that had, nevertheless, been extensive and deep. And if you read over what follows next from Parey (p), you will, perhaps, not disapprove what I conjectur'd a little before of that woman.

There are, besides, in the Sepulchretum, other observations relative to poison; although, contrary to what is generally done elsewhere, they are not referr'd to in this section.

You will find them in the seventh and eighth sections of the third book; in the former seven, or rather six; for that which is propos'd in the seventeenth observation, in the second place, is so evidently the same as that which had already been produc'd in the third observation, in regard to a professor at Padua, that it is astonishing it had not been observ'd: and in the other section, five or six; the first of which, that is the fifth, relates particularly to arsenic; about twelve little pieces of which were found to adhere so closely to the coats of the stomach, that they could scarcely be pull'd away: the same coats being extenuated, as we have said they were in the dog; and the fundus of this viscus being, besides, eroded and inflam'd; and the carcase quite livid on the back part.

But besides vomitings and stools, no other symptoms are taken notice of. And the other symptoms which we have enumerated in both the sections, relate either to other poisons, or to such as were unknown. The effects of which, when consider'd in the dead body, were generally an inflammation and erosion of the stomach and intestines; but in living bodies there were different symptoms at different times: yet none was more frequent than vomiting; instead of which, if there was at any time, or soon after succeeded, a fruitless effort to vomit, the patients then were worse, and died sooner, than those in whom the other symptoms seem'd to be equal.

And as this symptom of vomiting is also common to those, in the same manner, who have taken arsenic; if you should happen to enquire what, besides this, has been observ'd to be most frequent, you will find that it has been dejection of strength, or such circumstances as denote it; I mean, a coldness of the extremities, or of the whole body; cold sweats, paleness, and sometimes a syncope itself.

This dejection of strength; which depends upon the stomach being affected, and drawing the heart into consent, by means of the nerves; a very uneasy anxiety, as I suppose, rather than a sharp and cutting pain, precedes and accompanies. At least, in those persons whose symptoms we have describ'd, and even in children, or in dogs, we do not read that there were any clamours; but we read of an anxiety in two children, which children scarcely know how to express.

(o) § 5. in Obs. 4.

(p) Ibid. § 6.

However, in one the symptoms of tormina and singultus are remark'd; in one a tumour of the abdomen; in some a thirst; in others a swollen tongue, or apthæ in the mouth; or an impeded deglutition: or a sense of burning and heat. And in whom convulsions were manifest, or not manifest, has been pointed out above.

But some of these symptoms have now and then happen'd, and some pretty frequently, from other corrosive poisons also.

And indeed, when you shall depart from the Sepulchretum; in which alone, consider'd with a view to the effects of arsenic and sublimate mercury, those things that I just now said of clamours, and pains, and what I hinted at above, in regard to bloody excretions, seem reasonable to be said; I do not doubt but you will immediately think otherwise, and not without good reason.

5. That you therefore may read over, and compare, the more attentively, the histories which we have not in the Sepulchretum; I will immediately point out a considerable number: and all of them likewise relating to mineral poisons. From the glass of antimony (which had been heedlessly given to a coachman) among other symptoms, the celebrated Bæumlinus (*q*) observ'd bloody stools; spasmodic motions; and finally, death itself; the stomach being internally abraded, and ting'd with a red spot, near the pylorus.

Although the dog, into which Jo. Adr. Sprengelius (*r*) had forc'd the same glass, suffer'd nothing but strong convulsions, while he attempted to vomit, but, by reason of his mouth being tied up with a muzzle, could not; yet that experienc'd man (*s*) has admonish'd us, that the nature of brutes, which is "much stronger than ours, and for the most part extremely different therefrom," may overcome those poisons which our nature cannot.

And indeed, observations are extant (*t*), which show what paralyzes and convulsions, join'd with howlings, have been the consequence of the glass of antimony in another dog; and in what part of the stomach an evident inflammation arose; so that if he had not been open'd while he was yet alive, perhaps more violent symptoms might have been brought on: and they speak also of a woman, who, by reason of having taken in a quantity of this glass, fell down upon the ground, after enormous vomitings, and lay like a dead person, rigid and convuls'd; but was soon after seiz'd with a very violent pain in one foot, which was succeeded by a gangrene and sphacelus; so that, as in the case of the coachman, this medicine did not bring on the proximate cause of death in this woman, but nevertheless gave occasion and origin thereto.

Another experienc'd man, Jacobus Fælix (*u*), having given emetic tartar to a dog, and open'd him while he was yet vomiting, saw a very great inflammation at the pylorus for the space of some inches.

(*q*) *Commerc. Litter. A.* 1739. Hebd. 16. n. 1.

(*r*) *Experim. circa varia venena &c. Ex.* per. 41.

(*v*) *Ibid.* §. 50.

(*t*) in *Additam. ad Sect. hanc Sepulchr.* Obs. 12. Hist. 2. & 3.

(*u*) *Experim.* 11. inter ea quæ addidit *Dissert. de Mot. perist. intestin.*

It does not escape me, that there are very celebrated men (*x*), who contend that true arsenical particles have never yet been demonstrated in antimony: nor have I, for that reason, quoted these examples; and still less will I produce, from the celebrated Henckel (*y*), that of butter of antimony being given through mistake, and a constriction of the fauces and stomach immediately coming on; together with a very great heat; and after that, for months and years, such disorders of the stomach, as to make it evident, that unless milk had been immediately and largely given (and this was done also in the case of the coachman, but too late, and therefore to no purpose), which; not so much by assisting the vomiting, as by entangling and confining the very sharp and corrosive poison amidst hard curds, and cheese-like coagula, that were thrown up in great number; brought relief to the patient, he must have perished in a most miserable manner.

Yet there would not have been so erosive a quality in that poison, if it had not been prepar'd with sublimate mercury. But that you may compare the effects of this mercury with the effects of that butter, read the cure of Kramerus (*z*), which was happily brought about, not by milk only, but by the mixture of oil of tartar per deliquium, as it is call'd, and other things; in order to rectify and correct the mercury.

You will find that there were such erosions of the mouth, the œsophagus, and stomach, before the remedies were administer'd, as caus'd great quantities of blood to be discharg'd, both by vomiting and stool; and that very frequently; together with writhings, tormina, deliquia, convulsions, and other symptoms of that kind.

And Baccius (*a*) observ'd, from the same sublimate mercury; but to all appearance in less quantity, and certainly taken with other things; severe tormina and violent vomitings; by means of which, at length, a purulent and "burnt" ichor was discharg'd after three days, and therewith also life itself. What appearance was found upon dissection, if any dissection was made, he does not say.

Sproegelius (*b*), however, having given sublimate mercury to a cat and a rabbit, relates that the former died within the first five minutes, and the latter as soon as ever the poison was taken in; and that without any preceding symptoms, except very slight convulsions in the former, and in the latter, a vomiting: and he adds, that in the cat, the internal coat of the stomach was every where inflam'd, most in the fundus, but no where in the latter; nor indeed could it be by reason of the cole worts which had been eaten just before; but that death had come on so speedily, because the poison being given with water, and dissolv'd therein, had immediately exercis'd its force upon the nerves.

But when he had given it to a dog in like manner (*c*), whose stomach was empty, he found the villous coat thereof, in this animal, every where fill'd with the spiculæ of the poison; and for that reason partly red, and partly

(*x*) *Commerc. Litt. A. cit. Hebd. 24. n. 1.*

(*y*) *Ad. N. C. Tom. 5. Obs. 95.*

(*z*) *Commerc. Lit. A. 1735. Hebd. 30. n. 3.*

(*a*) *De Venenis &c. ubi an venenum natriet. &c. n. 6.*

(*b*) *Exper. cit. Exp. 26. & 29.*

(*c*) *Exp. 28.*

livid: as he also saw the whole mouth, and even the stomach, but particularly the upper orifice of it, very much inflam'd, black, and gangrenous; notwithstanding he dissected the animal when it was yet living, and after he had observ'd it to vomit with violent strainings for an hour or more; the strainings being join'd with inquietude and howlings.

In none of these three animals, except the first, has he made mention of black and coagulated blood in the heart. I see one experiment only of Jacobus Fælix (*d*) of the same kind of poison being given, though with an equal weight of arsenic at the same time: this experiment was on a dog, which he open'd immediately after having twice vomited, instantly from taking the poison into the stomach: yet he found a violent inflammation of the stomach.

And this he found in the stomach of another dog also (*e*); especially towards the pylorus, and to a very violent degree in the neighbouring intestines; but the slighter in proportion as it came nearer to the large intestines. It is true, he cut open this dog alive; but not till after he had vomited nine times: whereas he had given nothing poisonous but arsenic. And as the question is here, principally, of this poison, according to the tenor of the history I have propos'd (*f*); I will not omit the experiments made by Sproegelius (*g*), either with this poison, or others of the same kind.

He forc'd into the stomach of a cat, and a dog, a quantity of "white" "crude" arsenic. Strainings to vomit being observ'd, together with marks of anxiety, and convulsions, or concussions; both the animals were open'd before they died: and in the stomach, which, both about the pylorus, and in every other part, was inflam'd, he found coagula of blood that had been extravasated betwixt the rugæ, or among the villi, and concreted there: and in the dog, this kind of blood surrounded the arsenic.

Cobalt, which is the ore of arsenic, having been thrown up in vomiting, by one or two dogs, without any injury; he tied up the mouth of another (*h*), that the animal might not vomit: and the most violent efforts to vomit came on; together with anxiety, convulsions, weakness, and, within a very few hours, death.

In this dog the stomach was, in some places, a little livid, and every where greatly inflam'd, as the intestines were also; but proportionably less, as they were more distant from the stomach. Nor are observations wanting of the fatal effects of cobalt, when taken into the stomach, in human bodies; so that one, of the celebrated Kundmannus (*i*), contains the death of three at least, which follow'd from thence within a few hours; all of them having been seiz'd immediately with the most violent tormina, enormous vomitings, and cold sweats: the back part of the bodies after death being livid, the stomach very much inflam'd, and a bloody humour flowing from the eroded vessels of that viscus.

The same observation also speaks of the death of a woman, after tormina and vomitings of that kind; death coming on within a few hours after swal-

(*d*) addit. ad Differt. cit. Exp. 10.

(*e*) Exp. 9.

(*f*) n. 3.

(*g*) Exper. cit. Exp. 30. & 31.

(*h*) Exp. 35.

(*i*) Act. N. C. Tom. 5. Obs. 102.

lowing red arsenic. And as to yellow arsenic, or auripigmentum, as it is call'd; what sence of heat and erosion, and how many repeated vomitings and stools have been excited thereby; and in how great quantities; Gerbezius (*k*) will inform you: and from him you will also learn, that it almost kill'd a whole family, some of whom discharg'd blood from the mouth and from the intestines; and that it kill'd a girl entirely: so that what you will read in Heydius (*l*), of chrystals being taken out of auripigmentum, and given to a hen, whereby she was kill'd; and this by means of a flux of the intestines being brought on; is less to be wonder'd at.

And although litharge has no relation to arsenic, but to lead; yet it is worth your while to read the experiment made, by Brunnerus, upon a dog, by giving him this poison dissolv'd and boil'd in vinegar; and his account of the dissection: and the observations also of Jo. Jac. Franc. Vicarius (*m*), made upon persons who had drunk of wine, into the casks whereof, litharge, boil'd with bole, had been thrown, in order to correct its acidity, deserve your notice and attention.

Nor are others less worthy of attention; as, for instance, one of the celebrated Jo. Mat. Mullerus (*n*), and another of the celebrated Just. David Hammerus (*o*). For from the tormina, vomitings, stools, anxieties, deliquia, and thirst, which we read of in the first; and from the thirst, heat, and bloody stools, that are read of in the second; and also from the speedy death in both cases; and in like manner, from the spots of the whole body, the red marks of the whole alimentary canal, and the subtile perforation of the intestinal coats, in several places, which we read of in the first; and from the black colour of the body posteriorly, the great external inflammation of the stomach and all the intestines, and the internal erosion of those parts, that are propos'd in the second; it is very certain, that a corrosive poison had occasion'd these appearances in both cases: although what this was, by no means appears for a certainty.

But it is certain, that, in the histories I shall point out briefly, both the symptoms, and the diseas'd appearances of the viscera, were the consequences of arsenic having been taken in. Preussius (*p*) mentions a constriction of the fauces and chest; a thirst, heats, gnawings, tormina, very great vomitings, and frequent intestinal discharges. Mullerus (*q*), whom I have already commended; besides these symptoms, and pains of the belly; speaks also of the swelling of this cavity immediately, and anxieties. And Maurice Hoffmann (*r*) likewise takes notice of a speedy swelling of the belly, but a much more considerable one; a lividness of the face and eyes; and contortions of the neck.

The celebrated Heimreichius (*s*) mentions continual vomiting, for four-and-twenty hours successively, together with horrible clamours, a tremor of

(*k*) Eph. N. C. Dec. 3. A. 5. & 6. Obs. 137.

(*l*) Obs. Med. 49.

(*m*) Dec. modo cit. A. 4. Obs. 100.

(*n*) Eph. N. C. Cent. 5. Obs. 51. in Schol.

(*o*) Commerc. Litter. A. 1738. Hebdom. 10.

n. 3.

(*p*) Eph. N. C. Cent. 3. Obs. 15.

(*q*) Obs. paulo ante cit. & Schol.

(*r*) Eph. N. C. Cent. 9. & 10. Append. n. 1. Obs. 38.

(*s*) Act. N. C. Tom. 2. Obs. 10. circa medium.

the limbs, and a palsy of the feet. The celebrated Jo. Phil. Wolffius (*t*) speaks of very severe pains of the stomach and belly; join'd with a cholera morbus. Hammerus, whom I have quoted above (*u*), and the most excellent Queralmalzius (*x*) also, mention very severe symptoms: the former violent vomitings, great weakness, and contractions of the limbs; and the latter, moreover, anxieties, cardialgias, a swelling of the eyes and the whole head, very severe, cutting, and eroding pains of the intestines, heats, and other similar effects.

But as the arsenic in these cases, in general, though not in all, was in great measure thrown up by these vomitings; and as whatever remain'd thereof, and the beginning disorders arising therefrom, were envelop'd and restrain'd by mild oily medicines, and particularly by milk; I shall point out other observations made, both before death and after, upon those who could not be sav'd.

Etmuller the son (*y*) relates of a girl, that having taken arsenic, and thrown up a great quantity of viscid fluids in the beginning of the night, she was found dead in the morning: and yet the carcase, besides a kind of livid and blueish tract externally, did not, when dissected soon after, shew any appearance in the viscera, that you could impute to the poison: there was no where any thing putrid, or foetid in the intestines; no inflammation or erosion in these viscera, or in the stomach: although the stomach, among other things, contain'd a white powder, which, when thrown upon burning coals, afforded an arsenical fume; and a powder similar thereto, which had been found in the house, being forc'd into the stomach of a little dog and a cat, kill'd the former in an hour and a half, and the latter in three hours, after having excited very great vomitings: the stomach of the cat being inflam'd in a small part, and that of the dog in a large part; as was also the neighbouring intestinum duodenum, near to which there was an enormous erosion.

But from these effects the stomach of the girl seems to have been defended, by the great quantity of viscid matter and food, which she had before taken; yet not so from the irritation of the internal coat, and of the nerves that go thereto.

And examples are produc'd of arsenic being applied even externally, and exerting its efficacy; either where there are ulcers of the skin (in regard to which affair, as it does not greatly relate to the present question, we refer you to those things that I have written in a former letter (*z*)) or where it is found; to the examples of which kind, that, in particular, may be added, on which the observation of Heimreichus, just now quoted, turns; whether you consider the celerity wherewith it was injurious, or the violence and obstinacy of the injury, when arsenic was sprinkled on the hair, instead of what is call'd Cyprus powder: not to say when it was endeavour'd to distinguish it by smelling.

(*t*) Ecrund. Tom. 5. Obs. 29. in fin.

(*u*) Commenc. Litt. A. cit. Hebd. 27. n. 2.

(*x*) Commenc. ejusd. A. 1737. Hebd. 28.

(*y*) Eph. N. C. Cent. 3. & 4. Obs. 126. cum Schol.

(*z*) Epist. 55. n. 12.

Yet because, in the stomach of the girl in question, neither pustules, nor tumour, nor redness, were seen; for that reason, I suppose, examples are not omitted of injuries of another kind, and these attended with the greatest danger: which, though they generally arise from taking arsenic, are also frequently brought on by the vapours thereof.

But let the case be however it will in this girl; there will be no occasion to enquire very strictly, how three or four others, whose histories I will here only touch upon, being about to add some below (*a*), were kill'd by arsenic. For that dissected by Tyson (*b*) had a foramen in the stomach, which was neither very small, nor regular. And the fundus of this viscus was, in an old woman, examin'd by Maurice Hoffman (*c*), found to be ulcerated, as it were, sphacelated, and black.

So also, in another woman describ'd by Wolffius (*d*), already quoted, it was found to be quite eroded; and not without a very violent inflammation of the pylorus, which inclin'd to a sphacelus. And in a man whom the celebrated Henckel (*e*) open'd, were spots of a considerable size, either of a yellow colour degenerating into brown, or reddish, extending themselves towards the pylorus; and, moreover, two angular foramina of the villous coat: one towards the pylorus, and the other near the œsophagus.

This man had been carried off, in a short space of time, by very violent heart-burnings, heats, great pains, faintings, and vomitings. And that woman was seiz'd with great anxieties of the præcordia, and with vehement, and, at the same time, continual vomitings and stools; and, finally, with convulsive motions; whereby her limbs were miserably distorted: so that she died within ten hours, or less, amidst the most violent tortures. And that you may not have any room to doubt from whence all these symptoms had their origin; in the stomach of both of them was found arsenic.

6. Thus far I have taken notice of the symptoms which are the consequences of taking arsenic, in particular; as I could gather them from histories that are extant, either in the Sepulchretum, or in other authors, whose observations might be added thereto: and though this reviewal has, probably, been more prolix than you would wish, yet it, perhaps, has not been altogether useless.

Now I shall tell you what I have seen myself at two different times; first in one person, and in the second place in three: all of whom I suppos'd to be affected with this poison, when I well weigh'd and consider'd all the circumstances that I could find out by enquiry afterwards.

The first was a man of a robust and large body, and of a pretty full habit, whom, having been seiz'd with a fever, I had now almost cur'd; the fever being so much remitted, that he sometimes rose from his bed. This man; within less than half an hour after his supper, wherein he had taken nothing but some bits of bread boil'd in broth; was seiz'd with a very troublesome vomiting: and the more so because it very frequently return'd.

At an unseasonable hour of the night, one of his domestics came to me,

(*a*) N. 9. & 21.

(*b*) Aët. Lipf. Supplem. Tom. 3. S. 4.

(*c*) In cit. Append. Obf. 35.

(*d*) Cit. Obf. 29.

(*e*) Aët. N. C. Tom. 2. Obf. 155.

telling me the case, and begging to know what was necessary to be done. Supposing the uneasiness to be increas'd from thence, that the patient was oblig'd to vomit with an empty stomach, I order'd broth to be given him; and if the vomiting, nevertheless, continu'd to be troublesome, desir'd that a glyster should be given to take it off.

All this being of no effect, he return'd; and I order'd other things; among which was, at length, one grain of purified opium; saying, that if this had no effect, I myself would come. The opium also being thrown up in a quarter of an hour, I arose, and went to the patient together with the servant.

As I was going along; being surpriz'd that so violent a vomiting should come on suddenly, and continue so long without a manifest cause; I ask'd the servant whether the patient had been guilty of any irregularity, and whether he had taken more or less of any thing at his supper than had been already said. The servant saying that nothing had been taken besides that bread boil'd in broth; "Nay, says he, and that powder which you order'd was sprinkled upon it by N."

I, however, who had order'd no powder to be sprinkled upon it, and was not ignorant what might be the intention of this person who had sprinkled the powder, thought to myself, without taking any notice to the servant, what I must immediately do; how far I must conceal what I had learn'd; and what I was to beware of hereafter, and in what manner.

And now I had come to the patient, who complain'd, miserably, not so much of a vomiting, as of an inexplicable kind of writhing pain at the scrobiculus cordis, as it is call'd; and implor'd assistance as soon as possible. There was no tension in that part, or in the remaining region of the stomach; nor any pain. But a singultus troubled him very frequently; being attended with eructations, and often with a kind of difficulty of breathing. His pulse was very frequent; but rather weak and small.

Be of good courage, said I; you see how much deprav'd and vitiated humour you have thrown up (and a great quantity, indeed, there was; the viscid phlegm, wherewith he abounded, swimming at top; and at the bottom was the bread which he had taken: nor had he thrown this up at first, but some hours after); you must now be recruited with a very mild and good fluid: and I immediately gave him a large glass of cow's milk, which I got as soon as possible.

No sooner had he drunk it, but he cried out that I had given him new life. And, indeed, all his symptoms became better: so that his pulse return'd, within two hours, to its natural magnitude and strength; the pain grew more mild; and the vomiting return'd no more; not even on provoking it by means of art.

But by giving the milk in repeated doses, and in greater quantity than before; so that it might be thrown up by the mouth, if the stomach was so inclin'd; or that it might sheath over, and wash the intestines; I obtain'd this second point, by loosening the belly: the pulse being, at the same time, become less frequent; and the difficulty of breathing, and singultus, (both of which symptoms were now observ'd less frequently) being remov'd to such a degree, as to be observ'd but once or twice on the following days; puddings,

puddings, also, prepar'd from barley, or rice, together with milk, were given.

And as much whey as he chose was given him to drink; for as the intestinal discharges came on, the thirst and heat grew greater, both which were reliev'd by drinking a quantity of whey. Whey also, or milk, injected by way of glyster, sooth'd the sense of heat wherewith the rectum and anus began to be troubled.

Not to make the history too long; within two or three days, all the symptoms that had been the consequences of this poisonous powder, were driven away: nor did the man, as long as he liv'd; and he liv'd many years afterwards; find any remaining marks of injury in the stomach or intestines.

Thus the viscid humours wherewith this man, as I have said, abounded; and the speedy and frequently-repeated vomitings; and, finally, the milk and serum, by the quantity of which, whatever of poison, or its effects, remain'd in the stomach or intestines, was entangled, diluted, wash'd off, and carried out by the intestines; sav'd him from the threaten'd and imminent destruction.

I might now openly declare by what means I took care that this powder, which I afterwards understood to be white, should not be again given to the patient; for it is long since that the persons have been dead; and at the same time shew in how much danger a physician may frequently be, unless he dissembles his knowledge of some things: and in how much danger the patient may be, whether he hears certain things from the physician or not; and yet in what manner I prevented new snares being laid for the patient's life: and, at the same time, escap'd the revenge of a wicked man, who would have been greatly irritated, if he had perceiv'd that his designs were obviated by my endeavours.

But it is better to pass over to those things which I have seen in three other persons, in whom the same conjecture, but not the same dissimulation, was necessary.

7. In the month of May of the following year, which was 1711, that excellent priest Francesco Balducci was returning home from a sacred peregrination, when he stopp'd a little while at Cesena, just that he, and the three others with him; who were, as well as himself, in the prime of life, and in very good health; might dine frugally and without delay.

These persons were his own brother's wife, another woman, and a man. Soon after dinner they went out from the inn, and continu'd their journey. But they had not gone far before the priest was seiz'd with so great a pain in his belly, that he was under a necessity of being taken from his horse.

When he was taken off, he discharg'd a great quantity of matter, both by vomiting and by stool; and yet this pain, join'd with an inexplicable *angor*, or writhing pain and anxiety, increas'd to such a degree, that he seem'd to be giving up the ghost. Being carried back to Cesena, he was suppos'd by the physician, to be affected only with a colic pain; because the seat of the disorder was in the right epiploic region. Through the whole of that day, therefore, and a great part of the night, he applied as many glysters, fomentations, potions, and bolusses, both of an anodyne and purging nature, as

any other physician would have prescrib'd within many days ; but all were to no purpose.

And although this physician saw one of the women, in the mean while, seiz'd with vomitings and purgings ; and, moreover, with swoonings ; and heard the man complaining of a heat and weight in his stomach ; still he did not suspect any thing of poison ; I suppose, because the other woman, who had din'd at the table with them, had not found the least bad symptom ; and the master of the inn, also, very firmly asserted that there could be nothing hurtful in that dinner ; and because the man, who had of his own accord taken theriaca, found the heat of his stomach greatly increas'd therefrom.

He himself prescrib'd an anodyne emulsion for the woman who was disorder'd. But both this woman and the priest were reliev'd by the disease itself ; by the force whereof a great quantity of matter continu'd to be discharg'd from the stomach and intestines. And these discharges being diminish'd about the morning, they all went together in a carriage to Forli, immediately sent for me, and related every thing that had happen'd.

Upon hearing the relation, I instantly enquir'd whether there was any dish in the dinner whereof the woman, who had not been affected, had eaten nothing : and when I heard that there was, (to wit, a pudding made of rice, which was brought first of all in a large dish) I said that there must, then, be poison in that pudding. And so we should believe, said they, if they who ate the most of it had been the most affected ; and they who ate only little, the least : but the case is quite otherwise ; for this priest, who ate the least of that dish, as he did of all the others, has been, and is, the most violently affected : the woman, who ate something more than he, has been less violently affected : and the man, who ate a great quantity, was, and is, disorder'd in the least degree of any.

But was not, said I, some scrap'd cheese sprinkled over this pudding, as there generally is ? When they answer'd that there was ; and that the priest, having no appetite, had taken scarcely any thing except that cheese ; but that the woman had eaten much more of the rice than of the cheese ; and, finally, that the man had scarcely taken any cheese, but a great quantity of rice ; You yourselves, said I, perceive plainly, without any hint of mine, that there was a corrosive poison in the cheese ; perhaps, mix'd therewith in order to destroy mice ; and that this cheese, not having been laid aside, (as it ought to have been with the utmost caution) somebody, who was ignorant of such a mixture, had sprinkled it upon the pudding, at the time when the servants of the inn were in a hurry to prepare your dinner.

I seem'd at that time to have conjectur'd justly ; and still more, when, a long time after, the innkeeper ; having heard that these persons had escap'd the danger ; being less fearful on his own account, made no scruple to whisper something privately. Nevertheless, after clearing up the case thus far, two occasions of doubt seem'd still to remain : one, that in eating they had perceiv'd a certain odour of not a very agreeable nature ; I suppose, from the bad cheese ; but no unusual taste, and no sense of erosion afterwards, either upon the tongue or upon the fauces : the other, that although

I sup-

I suppos'd the poison to have been corrosive, it was not certain which of the corrosive poisons it was, so that any peculiar antidote might be oppos'd thereto.

But in the preceding case (*f*), also, there might have been the same occasions of doubt. For neither in that case, as you may safely argue from my silence, was there any mark of erosion upon the tongue, or in the fauces; nor did I know what poison, in particular, had been given: and yet my conjecture of corrosive poison was confirm'd by the great advantage wherewith milk and whey had been given; and it was at the same time shewn thereby, that where the species of poison is unknown, and you cannot apply its proper remedy; you must, at least, make use of that which is opposite to the genus thereof, which is less unknown.

I should have done the same thing in this case as in the former, if a greater number of discharges by vomiting and stool, which had preceded, but were now entirely remov'd, and the vanishing of the *angor* and tormina, had not already seem'd to prove the poison to have been evacuated. Yet, in order to obviate the effects of any that might happen as yet to remain; and, at the same time, that the thirst and the fever, which had follow'd so great a quantity of evacuations, and so violent a commotion of nature, might be allay'd; I prescrib'd a large quantity of whey to be drunk by the priest and the woman.

For as to the man; who was neither thirsty nor feverish, nor ask'd any thing else of me than that I would remove the sense of weight whereby his stomach was oppress'd; I assented to his petition, by giving him oil of almonds, with this intention, that I might rather excite vomitings than stools; and that with a remedy of such a nature, as, if any eroding particles still remain'd in the stomach or intestines, might be of use by entangling, and, at the same time, sheathing them.

However, as vomitings could not be excited, even by thrusting the fingers into the fauces as far as possible; the intestines were made lax, and the sense of weight was entirely remov'd. And as he was very well after this, I recommended to him nothing but puddings made of rice and milk.

These I gave to the others also by way of supper; when I had already observ'd the fever and the thirst to have grown very slight, by large draughts of whey. They had a very good night; so that the woman, on the following day, was quite free from fever, or any other symptom; and the priest, whose fever and thirst decreas'd gradually more and more, had nothing now remaining to complain of besides these: for the sense of heat which he had felt the day before in discharging his urine, was now quite remov'd.

And though through the whole of that day, and the following night, and a great part of the next day, every thing continu'd to grow better; and the intestinal discharges were free and easy, and unattended by any sense of heat; I did not, however, omit to give the same things that I had given for two days before.

8. But, behold! on the beginning of the fourth day from the time that

the priest had been seiz'd with that very violent pain, at the same hour in the afternoon, and without any previous manifest cause, he was seiz'd again with it in the same manner. His feet were cold in the beginning; his pulse was somewhat contracted. Besides the pain, there was a certain inexplicable anguish in the whole belly; whereby the patient complain'd that there was a great interception to his breath, and that by this chiefly he was oblig'd to writhe himself here and there, in a miserable manner, sometimes to rise and sometimes to walk.

But the pain occupied the right epiploic region, and the neighbouring part of the loins, sometimes extending itself from thence transversely, through the hypogastrium; at one time into the right side of the scrotum, and at others into the neighbouring thigh: so that it might seem to be nephritic.

But the man had not ever been subject to this nephritic pain: and that the pain, extremely similar to the present, if you except the vomitings and the stools, wherewith he had been attack'd four days before, had not been nephritic, not only that proximate preceding cause which I have spoken of above, but the violent effects thereof upon his companions, at the same time, evidently shew'd: and, finally, the urine being nothing chang'd, but perfectly similar to that of a healthy person, contrary to what is usual in nephritic patients, join'd to prove that the pain was not of that kind.

However, as none of those things which I had order'd to be applied externally were of any service; and the patient asserted, that he could not bear the application of glysters, for this reason, that a tumour of the hæmorrhoids, and a very great pain, had come on at the same time, together with a tenesmus; so that, if this pain should be exacerbated by the introduction of a pipe, he could not be capable of supporting himself under it; the urgent necessity of relaxing, and the similitude of the nephritic pain, impell'd me to try a remedy which is useful in this pain; I mean, a warm and emollient bath.

Nor did my expectation deceive me. For scarcely had the patient sat down in the bath, when first the *angor*, and a little afterwards the pain, remitted. But upon his coming out of the bath, and being again attack'd therewith; I was oblig'd to procure him a little sleep, and by that means to refresh him. By taking one grain of purified opium, therefore, he slept an hour.

Being awak'd, and finding himself somewhat less troubled with his pain, so that he could now take some food; I gave him a ptisan of fat broth: after taking which he slept the remaining part of the night.

On the day following, the patient being feverish, but having no pain in his belly, I gave him oil of almonds, and, at a certain hour, a clyster of milk and mucilages: and lest this glyster should be obstructed by the pain of the piles, though this was now become less, a very small tent was previously introduc'd into the rectum, smear'd over with the fat of frogs; as this fat, according to the observation of a physician who was my friend, was proper to assuage the pains of those veins; and when the tent was taken out, the glyster-pipe, in order to make it less troublesome, was cover'd over with the inverted gut of a young chicken, and by this means slowly and gradually introduc'd.

The glyster being injected, and he having retain'd it for an hour or more, he got some relief from a kind of *angor*, which was even then still remaining in the belly; and from his thirst. Against which, and the bitterness of the mouth, a great quantity of the water of Nocera, being drunk, was profitable.

After this time every thing grew better and better continually. And the woman obtain'd relief, also, from almost the same medicines, when yellow, but at the same time useful stools were now and then troublesome; by bringing with them a thirst, and certain slight and wandering pains of the belly, together with a tenesmus, which was attended by a sense of heat.

Nor was the priest free from yellow stools, but less fluid than in the other case; and attended with no inconvenience, but that of bringing on the pain of the piles. In these stools were quantities of mucus, which, being once compacted into a globular figure, and attentively examin'd by me, seem'd to resemble a kind of indigested fat, wherewith a sort of tendinous substance was mix'd.

This globular body was discharg'd on the fourth day after the relapse, together with solid excrements tinctur'd with blood; this blood not being mix'd with its substance, but only sprinkled upon the surface: so that you might perceive it to be from the piles.

Thus these two, also, recovering within eleven days from that almost fatal dinner, liv'd many years after, without any mark of injury being left in the stomach, or in the intestines. And, indeed, the priest was carried off by no other disorder than an aneurism of the aorta, within the thorax; which, beginning six years after, he bore for a long time, even to the utmost extremity that was possible.

9. Now, to begin from what was said last, and remark something, by way of addition to the other circumstances that were observ'd in the four patients in question; if you happen to find Paawius giving his opinion, in this tenth section of the *Sepulchretum* (g), that the signs of poison having been given, were a very great dilatation of the right ventricle of the heart, and of the neighbouring vena cava; and the blood concreted in the heart, and all the veins, as he imagin'd, in the living body, and by the force of the most cold poison; as if it had not been at seven hours after death that he dissected the body; do not suppose that the aneurism of this priest is to be consider'd as a confirmation of his opinion.

For dilatations of that kind are not so soon brought about as he seems to imagine; and, certainly, in our patient, the signs of an incipient aneurism did not shew themselves till many years after, as I have already said; so that, if you suspect it to have had its first origin from the constrictions which happen'd at the time of the pain and *angor*; yet you cannot contend, that this is to be consider'd as a symptom of poison, which others may suppose to have been brought on by so many other causes, and at so long an interval of time.

But as to what relates to the blood being coagulated both in the veins and the heart itself; I have frequently related this appearance to you, as having

been seen in bodies that had been kill'd by causes far different from poison: so that, if it happen'd from the blood being concreted within, as it is conjectur'd in the subjected scholium, that the heart of Germanicus (*b*) could not be burnt; a great number of hearts of other persons, also, in whom there could be no suspicion of poison, would be incapable of being consum'd by fire.

And what if you add to that which is here said, the opinion of the very ingenious Mead (*i*)? that poisons act chiefly upon the nerves, and not upon the blood; which opinion also seems to be consonant to that of Harderus (*k*): and, indeed, in regard to some poisons, this cannot be denied; as, for instance, those that kill instantly; such as Vibulenus Agrippa (*l*) “drew from his bosom in the very senate-house” (not from his *ring*, as Baccius (*m*) asserts, who had some other persons in his mind at that time, as I suppose (*n*)); “a poison, whereby he fell down and died so soon, that he could not be carried away into prison, even by the hasty hands of the lictors, before his eyes were clos'd in death, the halter being applied to his throat in vain;” or such as Locusta (*o*) prepar'd by the command of Nero, “very speedy and instantaneous” in its effects: whereby not only a little pig “was struck instantly dead,” but even Britannicus “fell down at the first taste:” for the virus (*p*) “so pervaded all his limbs, that his voice and his breath were equally and instantly taken from him.”

And to Mead himself (*q*) none seem'd more proper to confirm his opinion, than that poison which he says, from the experiments of Nichols, had kill'd a dog in its very passage through the œsophagus, “in less than half a minute in all;” and even when injected into the extremity of the intestine, did the same thing in a moment, without leaving any marks of inflammation or erosion behind: so that we need be less surpriz'd at those things I have remark'd above (*r*), of the rabbit from Sproegelius, or of the girl from the son of Etmuller; as both of them explain the case in the same manner, for this reason.

Yet as, while poisons affect the nerves, it happens that the motion of the blood becomes “various, or is intercepted;” to use the words of Wepfer (*s*); or that “the circulation is at one time impeded, and at another “time very confus'd;” it will happen, also, that the blood is found to be in a different state in different bodies.

Mead (*t*), therefore, supposes it to happen, that, if by an universal palsy brought on by poison, the circulation be suddenly suppress'd, the blood continues perfectly fluid in the vessels, the secretions being at other times (*u*), as in a disturb'd circulation, interrupted; and when the small vessels are ob-

(*b*) Sueton. de duodec. Cæsarib. l. 4. c. 1.

(*i*) Tract. de Venen. passim.

(*k*) Sepulchr. S. cit. in Schol. ad Obs. 17. Additam.

(*l*) Tacit. Annal. l. 5.

(*m*) De Venenis ubi de venenor. ingest. sc. vitia.

(*n*) Vid. Plin. Nat. Hist. l. 33. c. 1. & Annot. Dalecamp.

(*o*) Sueton. l. 6. c. 33.

(*p*) Tacit. Annal. l. 13.

(*q*) Tract. cit. in Append. Tentam. 5.

(*r*) N. 5.

(*s*) Sepulchr. ibid. in Schol. ad Obs. 3.

(*t*) Append. cit.

(*u*) Introduct. in fin.

structed by stagnation, (all which circumstances happen by reason of the nerves being affected) that the blood itself is variously chang'd; in consequence of its being a humour compos'd of divers other humours mix'd together, and liable to any changes whatever, from a change of its motion alone.

But these changes of the blood, besides that they are neither the first, nor the proper, effects of taking poison, may be far different in different bodies; according to the various affection of the nerves: and not only this, but according to the various disposition of the blood.

Therefore, not to quit the consideration of arsenic, the woman who died from taking that poison, as you have read above (x), had her blood fluid, and of a bright red colour; but the dog, which was kill'd by the same poison, as I related just now (y), had his blood black and grumous. And I remember that; when I dissected nine rats, of the larger size, which had been kill'd by poison, and sent me by a friend; I saw, in every-one of them, both the auricles of the heart distended with black blood: but not coagulated; nor, as in living bodies, very fluid.

Yet because I dissected those little animals, not to see what were the effects of the poison, but in order to be better acquainted with some things relative to the natural structure; I have nothing to observe here in relation to the present question; except that the stomach was very full in all of them, and not, as far as appear'd externally, inflam'd in any one, and much less perforated: and both these assertions will hold good of the intestines also.

Nor does Heydius (z) say, that in two rats, after having taken the same poison, the stomach, which was fill'd with slime and bread, was inflam'd or eroded. But this he says, that when he dissected one of them after death; for the other he had open'd when alive; "no blood flow'd out of the vessels: and even that from the ventricles of the heart, upon cutting off the apex thereof, not a drop of cruor distill'd:" but whether this was because it had been confin'd in other vessels or reservoirs, or because it was coagulated, is uncertain; as he does not add a word upon this subject.

On the other hand, it is certain from the experiments of the most excellent Ellerus (a), that when with blood newly drawn, he had mix'd a third or fourth part of the solution of arsenic, the blood was immediately thicken'd; though its globules, if examin'd by the microscope, were greatly extenuated, dissolv'd, and driven into motion as it were: among which globules appear'd, here and there, small triangular chrystals, that resembled the cutting points of arrows; so that from all these things he conceiv'd, that very strong corrosive poisons, of this kind, act by destroying, not so much the fluid, as the solid parts of our body.

But he was not ignorant likewise, that arsenic, when taken into the stomach, was not so immediately mix'd with the blood; and you, in fact, see that it cannot be mix'd in that proportion. It will be better, therefore, to return from drawn blood to the living body; and from dogs and rats to

(x) n. 3. (y) n. 4.
(z) Obs. Medic. 48.

(a) Hist. de l' Acad. R. des Sc. de Berlin
A. 1752. Class. Philos. Experim.

human bodies; and I will produce the appearances which Ruysch (*b*) found, from arsenic having been taken in.

He sometimes inspected carcases of that kind: and contrary to those who “think, that, in such a case, the blood only is coagulated,” he never found it coagulated, but the stomach ulcerated; if there had been time enough for it; as in a woman, a great part of whose stomach he preserv’d in spirits: to the internal coat of which, that was in various places affected with ulcers, white arsenic “adher’d.” But if it had happen’d that they died sooner, then he saw bloody points, lying at a distance here and there, through the stomach.

10. From these observations of Ruysch, join’d with those that are mention’d above (*c*), it is very clearly perceiv’d, that the first and proper effect of arsenic, when taken into the body, or of other corroding poisons of this kind, is exerted on the internal coats of the alimentary canal; especially of the stomach, wherein they first harbour: the nerves of these coats being irritated, and the coats themselves being prick’d; and if time be given, inflam’d, ulcerated, and pierc’d through.

In misfortunes of this kind, therefore, nothing can happen more desirably, than that the stomach may soon throw up what it had taken in; or at least as soon as possible: and from hence it has chiefly happen’d, that they who have been attended by me, in these cases (*d*), escap’d.

And it happen’d still much more happily to a certain gentleman, that; when, instead of cream of tartar, he had taken two drachms of emetic tartar; by some vomitings which follow’d thereon, not unattended with strictures upon the præcordia, he was immediately freed from all inconveniences of the stomach: the celebrated Dethardingius (*e*) supposing, that no sooner had some moleculæ of this medicine been dissolv’d, and stimulated the stomach to contraction, but, without giving time for the dissolution of the remaining particles, the whole of it; which otherwise must certainly have kill’d the man by its great quantity; was thrown up by vomiting.

But there are some who are by nature less prone to vomit. There are some also, in whom, after accidents of this kind, the fibres of the left orifice of the stomach and œsophagus are so strain’d into strong action, as to resist the fibres, which contract themselves, in the other part of the stomach: nor does it always follow, that, if any thing be then given, or forc’d down into the stomach, these resisting fibres, as Wepfer (*f*) teaches, are relax’d; for there are cases wherein the man then swallows, and yet is troubled with a fruitless effort towards discharging the contents of his stomach at the same time (*g*).

And even those who do not vomit soon, are sometimes less in danger; as, for instance, if they take the poison upon a full stomach. Baccius (*h*) therefore advises, that, when we cannot avoid a banquet, which we suspect, we neither come thirsty, nor hungry; but full of milk, and fat and viscid foods,

(*b*) Thef. Anat. 8. n. 70.

(*c*) n. 3. 4. 5.

(*d*) n. 6. 7.

(*e*) Eph. N. C. Cent. 9. Obs. 74. cum

Schol.

(*f*) Scholio cit. supra ad n. 9.

(*g*) Sect. hac Sepulchr. Obs. 4. § 6.

(*h*) De Venen. ubi de Particulari Præserv.

n. 1.

that we have previously taken. For he had seen (*i*), that, from the same poisonous food, which had been eaten by a whole family, the master alone died on that very day; as he had eaten upon an empty stomach; the others, who had eaten on a full stomach, being sav'd.

And though this circumstance does not always defend from poison, yet it very frequently retards the pernicious effects of it; as you have seen in the woman with whose case this letter began: and to the senators of Capua also, who were about twenty-eight in number, death happen'd very late, for this reason, that they had taken the poison when fill'd with food and wine; and, by this means, "had made the force of the poison less efficacious in bringing on a speedy death," as Livy (*k*) has transmitted down to memory in his histories.

So if a little poison be swallow'd down into an empty stomach, together with a great quantity of food, it is not surprizing, if the danger become less. For, by these means, either the poison is kept at a distance from the coats of the stomach, or is sheath'd over, and obtunded, by a great quantity of matter being mix'd with it. And in this manner may be explain'd most of the things that have been said above by us. I say most of them; for some of them are certainly more difficult: and this in particular, why the priest (*l*) was not seiz'd with pains in the region of the stomach, but in the right epiploic region.

Yet if this had happen'd only on the fourth day, it might then be conjectur'd that some particles of the poison, and particularly those retain'd in the cells of the intestine colon, had vellicated and prick'd the coats thereof. But that it should happen so soon after taking the poison; unless you suppose the stomach to have been somewhat more to the right side; as it, in fact, is in some bodies; or because this is very rare, the intestine duodenum to have been somewhat more to the right side, or something else of a similar nature, you will not easily account for and explain.

11. However, that it never came into my mind to make use of the theriaca, or other antidotes of that kind, in the cure of patients who have taken poison, I know you will not be surpriz'd. For why should I, when it was pretty clear that the poison was of an eroding nature, add fuel to the fire, and still more stir it up; or at least encrease its effects?

And indeed, I saw that when one of the four that I cur'd, had taken theriaca of his own accord (*m*), the heat of his stomach was encreas'd: for which reason I am less surpriz'd that the boy, taken notice of in the Sepulchretum (*n*), who had theriaca given him twice, should have died within four hours after taking arsenic: and if Jo. Faber (*o*) had given nothing but mithridate to the young man who had us'd the powder of *risagallum*, or orpiment, instead of cinnamon, he certainly would not have sav'd him.

But he did save him, because he gave him fat broths at the same time, and a great quantity of milk.

(*i*) Ibid. ubi Venena quibus modis fieri possint irrita. n. 10.

(*k*) Historiar. l. 26.

(*l*) Supra, n. 7. 8.

(*m*) n. 7.

(*n*) Sect. hac in Addit. Obs. 13. Hist. 7.

(*o*) Ibid. Hist. 12.

So I, also, suppose a boy and two girls, who were in great danger from having taken arsenic, to have been sav'd by Jo. Jod. Cysatus (*p*), not because he had given the *electuarium Orvietanum*, but because he had given milk frequently before; and because nature had previously assisted them all by speedy vomitings.

For alexipharmac remedies of this kind cannot entangle the eroding particles; nor can so envelope and cover them over, as to prevent them from inflaming and ulcerating by their asperities: nor yet can they soothe and cleanse the ulcerated parts: but, on the contrary, they must add new motion and power to these corrosive particles; and to the ulcerated parts, new heat and inflammation.

Whereas it is evident, on the other hand, that milk, oil, and other somewhat viscid substances, whey, and even water itself, by entangling some, by diluting others, of these particles; and, in fine, by soothing and cleansing the parts as much as possible; must strongly counteract the tendency thereof: especially if they be given in such a quantity as to assist the vomitings; and, if any poisonous quality remains after these, be continu'd so as to dilute and obtund its noxious energy.

And, indeed, although the ancients propos'd some things that are less suitable; Ardoynus (*q*), nevertheless, sufficiently shews how much they esteem'd those remedies we just now mention'd. But the more modern physicians; omitting the useless and the noxious applications; have approv'd of the others, when occasion has offer'd: some in their writings, and some even in the observations of others that they have collected.

Thus, in regard to milk, besides those that I have referr'd to above (*r*), many other observations are extant; among which is one, in particular, that Henry Doorschodt (*s*) says he had taken from Hoffmann: that is to say, an observation of ten young men being taken ill in a short time after eating water-gruel, wherein rather more than two ounces of arsenic had been mix'd with as many ounces of sugar; who were, nevertheless, sav'd by means of milk being given to drink, for so long a time, till all the efforts to vomit ceas'd: and it was necessary to give this remedy in so great a quantity, "that scarcely ten measures of milk were sufficient for each person."

Thus, to speak of oily remedies, (and oil of almonds, indeed, was given to these also, as well as to many others) what the moderns, as well as the ancients, thought of them, you will find propos'd by that celebrated man John Gentilis (*t*).

And in regard to aqueous remedies; among which is whey, and water itself; turn to a disputation in Etmuller, which is entitled, "The small beginnings of great diseases." Therein you will have an example (*u*) of a man who, having by mistake drunk that fluid which is call'd *aqua fortis*, was prevented from receiving any injury by drinking a large quantity of water soon after. To which add another from Sydenham (*x*); who, by means of

(*p*) Ibid. Hist. 2. & seq.

(*q*) De Venen. l. 2 c. 1, 2, 3. 5. ubi de Curat.

(*r*) N. 5.

(*s*) Dissert. de Lacte in Corollar.

(*t*) Annotaz. alla pag. 64. v. 5. della Lett. Filos.

(*u*) §. 47.

(*x*) Epist. Respons. l. vers. fin.

this remedy alone, given copiously by the mouth, and injected by the rectum, sav'd a man "who had taken down a very considerable quantity of corrosive sublimated mercury."

And Boerhaave (*y*); where he proposes such things as he thinks it necessary to apply where the species of the poison taken in is unknown; not only commends that cure of Sydenham's, but also recommends most of the remedies that we have mention'd above, and made use of in those patients; not even the bath and opium, finally, being omitted: and he shews how far the latter of these remedies may be useful.

The other remedies are not omitted in that part of Etmuller's works which I just now referr'd you to; and how far these have been advantageous when the poison was less known, the observation of Screti, in the Sepulchretum (*z*), demonstrates.

Yet when its species is known; how much more advantageous it may be to make use of the remedies that are peculiarly opposite thereto, you will learn from two histories that are pretty similar in most respects, except in their event; the one in the same place (*a*), the other in the works of the celebrated Mead (*b*); if you will compare them one with another.

However, I should here admonish you, if you were not capable of observing yourself, how different symptoms arose in those three persons whom I had under my care at the same time (*c*); though from one and the same poison. But of minerals enough; as you have also heard, on a former occasion (*d*), what mischiefs I have seen from sulphur, when taken into the stomach.

Now let us add a few things upon the subject of vegetable poisons.

12. A poor woman, about sixty years of age, who (whatever the cause of this intention might be) had attempted several times to throw herself into the river, having, last of all, gather'd a great quantity of the leaves of the *rhododaphne*; a shrub that, in our country, is call'd *oleandro*; and having drunk the juice express'd from them together with wine; was heard, about three hours after, by the women who were in the next cabins, to vomit very violently.

They ran to her, and perceiv'd what she had done: and, as she was thirsty, they gave her a glass of water, thinking that there would be no remaining mischief after the vomiting.

But, as they soon after perceiv'd her to be much worse, they first sent for the priests, and in the next place for our Mediavia; who happen'd not to be far off: and this was about five hours after the woman had drunk that poisonous juice.

In her respiration he observ'd nothing that deserv'd to be greatly taken notice of; nor in her face, if you except her lips of a brown colour, and particularly the lower lip; for the other parts were either of a natural co-

(*y*) Vid. Instit. § 1129. & Prælect. ad cund. §.

(*z*) Hist. 10. in cit. Obs. 13.

(*a*) Hist. 13.

(*b*) Tract. de Venen. Tentam. 4. in fin.

(*c*) N. 7, 8.

(*d*) Epist. 55. n. 9. & seqq.

lour, or were but just a little inclin'd to a pallid hue: nor was her body cold, but only a little less than warm.

As the women who were about her said that she had now no power of speech remaining; he cried out aloud in the patient's ear, who lay like a person asleep, to stretch out her hand. But she easily rais'd herself up to sit; and the women, in the mean while, having stretch'd out one arm, she soon after gave the other herself.

Her pulse was small, weak, and somewhat hard. Endeavouring to give an answer to a question that was ask'd her, she made a kind of inarticulate noise indeed, but utter'd no distinct word; pointing, at the same time, with her finger to the matter that she had vomited on the ground, which was considerable in its quantity. He prescrib'd remedies to be given her to drink immediately; but in vain. For she, taking scarcely any thing, died within four hours after he had seen her; so that she did not live more than nine hours after drinking the juice I have mention'd.

The carcase being order'd to be dissected on the following day, which was the seventeenth of November, in the year 1745, by the judge of capital matters; and Mediavia, by whom all these circumstances were related to me, presiding at the dissection; it was first of all observ'd, that there was nowhere any lividness in the fore-part of the body; nor did any tumour, not even of the belly, appear: but on the back-part it was universally of a violet colour, from the head to the bottom of the lower extremities.

The abdomen and the chest being open'd soon after, some heat was perceiv'd internally, even at that time; although it was seventeen hours after death. Within the former cavity every part was in a natural state, and a natural position; so that neither the stomach, nor any other viscus, was swollen: for as to the transverse tract of the colon being reflected downwards for the space of three or four inches, and returning up again from thence; this is an appearance which, as you may have learn'd from my letters, is met with very frequently, even in those persons wherein it seems to have happen'd thus naturally, rather than from disease.

But when they fix'd down their eyes very attentively, they observ'd that the veins which pass through the stomach, the omentum, and a part of the intestines annex'd to the mesentery, were very much distended.

On cutting into the stomach, they saw therein a green humour, in a small quantity. This being wip'd away, no mark of disorder was found any-where in the stomach: except that the rugæ, which pass'd through the fundus longitudinally, near to the antrum pylori, were harder than they naturally are.

Nor was there any thing preternatural in the duodenum, when open'd: notwithstanding it contain'd some of the same green humour that they had seen in the stomach: which, perhaps, was from bile that had been pour'd out, and mix'd with acid juices; although the gall-bladder was found to be moderately full: for that juice which the woman had drunk, would rather have retain'd its black colour from the wine that was mix'd therewith.

In the thorax, the right lobe of the lungs was connected to the pleura; being very red on the back-part, and seeming to have some coagulated blood,

as it were, within its substance. Yet the left lobe was not only every-where loose and unconnected; but so collaps'd into itself, as if scarcely any air was left within: and it was but a little red on the back-part. In the ventricles of the heart there was not the least fluid or coagulated blood. However, when the larger vessels of the heart were cut into, a great quantity of blood flow'd out, which was neither grumous and coagulated, nor yet more fluid than natural.

The head was not touch'd.

13. I have the more willingly committed this observation to writing, because I do not remember to have read, in any author, the dissection of persons kill'd by this poison; nor yet that the symptoms which ensue upon its being taken into the stomach, have been observ'd by any one of the more modern authors.

And the ancients have not all asserted it to be hurtful to the human body; nay, some of them, on the contrary, have asserted it to be useful. "The *rhododendros*," says Pliny (e), "does not even find a Latin name amongst us: they call it *rhododaphne*, or *nerium*. What is surprizing of this shrub is, that the leaves of it are a poison to quadrupeds; but a security to man against serpents, when drunk in wine, with the addition of rue. For sheep and goats are said to die, if they drink water wherein the leaves of this shrub have been macerated."

And you will see that Dioscorides (f) has written what is pretty similar to this; and that neither Apuleius (g), nor even Lucian (h), whom he then almost copied, had taken notice of it as being pernicious to any creature but beasts. It is certain, indeed, that the former has said the flowers of this shrub, which were commonly call'd "laurel roses," are "a poison:" but he says this, because "it is death to all cattle to eat them."

Nay, Lucianus had even asserted that they were not pernicious to all these animals, but only to asses and horses. For thus have they faithfully render'd him into Latin: "This food is bad for every ass and horse; for they say, that any of these creatures which have eaten of it, die immediately." On the contrary; to pass over Scribonius (i), who says, with some considerable plainness, that he who should be willing to chew the leaves of the *rhododaphne* as a remedy against the tooth-ach, must not swallow his spittle; Galen, at least (k), has expressly taught us, that this shrub is not only pernicious to cattle, but to men also.

And all the principal of the Arabian physicians, whom you will find particularly quoted by Ardoynus (l), have propos'd remedies against this poison. And as to the symptoms which follow upon its being taken into the stomach; that are collected both by the same author (m) and by Matthiolus (n); they come pretty nearly to these: a violent streightness arises, the belly swells, is painful, and becomes lax; an inflammation is created; and a heat of the

(e) Nat. Hist. l. 24. c. 11.

(f) De Med. Mat. l. 4. c. 77.

(g) Metamorph. l. 4. prope initium.

(h) In Lucio, sive Asino.

(i) Compos. Med. 55. cum Rhodii nect.

(k) De Simpl. Med. facult. l. 8.

(l) De Venen. l. 3. c. 21.

(m) Ibid.

(n) Comment. in c. 12. l. 6. Dioscorid.

whole body, a loss of sense, a syncope, and death, follow after: and these because the rhododaphne is immoderately heating; and, in like manner, incides, bites, ulcerates, and resolves.

But as you will readily acknowledge, that scarcely any of these symptoms and effects were observ'd in the patient we have describ'd, when living; or in her body after death; so you see plainly that there were other and far different appearances: for which reason, I doubt not, but you will wish with me, that whenever any one was hurt by this poison, whether in ancient times, or since, we could have the histories of what had happen'd to them written; rather than the diagnoses of many authors, who frequently copy from one another; and which sometimes correspond more to their own hypotheses than to observations.

And as experiments have been made upon dogs from so many other vegetable poisons, by Wepfer, and by others; and as the symptoms they suffer'd while living, and the appearances found in their viscera after death, have been observ'd by these authors; so I could wish, that either the same thing had been done in regard to this, or that I had time to do it at present: I would do nothing more willingly than compare all the observations of this kind one with another; that we might see what difference we could distinguish in one from the other, in regard to the species, the temperature, the age, the country, the part of the plant, or the state of it; or, finally, in regard to the fluid that was mix'd therewith.

14. Now, if we consider this one observation; we shall think it probable that this poison had acted upon the stomach and its nerves, and, consequently, upon others that cohere therewith. For what were the very hard rugæ of the stomach; what those vomitings; what that bile, as it seem'd to be, press'd out; what the lost power of speech; what that kind of sleep, as it were; what were other circumstances that I now pass over; but symptoms that lead us naturally to conjecture some internal convulsions and contractions, whereby the blood also might be stopp'd in its course, and distend those external veins of the stomach and intestines?

Nor would I have you say, that, if all these things happen by the stomach being vellicated internally, the internal surface of the stomach itself ought to have appear'd to be more inflam'd with distended vessels. For it is sufficient that the stomach is so vellicated as to irritate its nerves, in order to explain those things that I have spoken of; but that it should be inflam'd, is by no means necessary.

For, to take notice, first, of an observation made on the human body; in regard to the *coriaria*, or that plant which was call'd *rhus myrtifolia monspeliaca*, C. B. how speedy, how repeated, how horrible, and, in a short time, how fatal an epilepsy it excites, is shewn by that very celebrated man Des Sauvages (o).

Yet the same author could not find, by examining the body of this man af er death, (who was kill'd by eating only fifteen of the berries of that plant, at most) any injury of the brain, or of any other part; and particularly of

the stomach itself; wherein there were, even then, five berries of the coriaria; the others having been thrown up by means of an emetic, that had been given.

And to pass on to many observations, and those upon several brute animals of different kinds; certainly a great number of violent symptoms were undergone by a dog, and in like manner by a cat; the former of which was kill'd by Heydius (*p*), by giving two of the nuts call'd vomica; and the latter by Sproegelius (*q*), by forcing down a drachm of napellus.

Yet in the dog "the stomach, the œsophagus, and the intestines, were quite in a natural state:" and the stomach of the cat was "very similar to one in its most natural state; and nothing like erosion was seen: the viscous coat being very bright and smooth, and the intestines, together with the other viscera, in a very healthy state."

Therefore, as Heydius had thought it to be pretty plain, from his observation, that the fluid, by which the brain and nerves are moisten'd, was chiefly "infected by this poison;" so Sproegelius (*r*) has concluded as follows from his: "Since I have seen no sign," says he, "either of erosion, or inflammation, in the animal killed by this poison, it must chiefly have exerted its influence upon the nerves; by vellicating the nervous membrane of the stomach."

And indeed, turn to the experiments of Wepfer, Brunnerus, and Nichols, made upon those animals, to whom they had given some vegetable poison; and to some of them the same that Sproegelius and Heydius had given; you will read that there were violent symptoms in all of them; which came on soon after taking the poison: yet you will not find that the stomach was inflam'd in all of them.

For in one of them (*s*), "the internal surface of the stomach was white: nor did the least sign of inflammation appear in any part." In another (*t*), "the rugæ of the stomach were white; and if, in some places, they were a little more red than is observ'd at other times, they nevertheless were not manifestly inflam'd." In a third (*u*), "no signs of inflammation could be observ'd in the stomach, notwithstanding the surface of the rugæ was less white than it is found at other times to be." And, finally, in a fourth (*x*), the stomach and intestinum duodenum "were quite white on their internal surface, and free from all inflammation."

And in none of those that Nichols dissected (*y*), "was any inflammation of the membranes to be seen internally;" but the veins were distended with fluid blood, such as they were distended with in the cat of Sproegelius: and this I take notice of, because there was not any coagulum of blood in the four animals just now taken notice of from the Sepulchretum; and indeed, in one of them (*z*), as well as in the woman in question (*a*), "not the least quantity of blood remain'd in the ventricles of the heart."

(*p*) Obs. Medic. 50.

(*q*) Experim. circa venena Exp. 2.

(*r*) §. 5.

(*s*) in Additam. ad Sect. hanc Sepulchr. n.

Obs. 5. Hist. 1.

(*t*) Ibid. Obs. 6. Hist. 1.

(*u*) Ibid. Obs. 7. Hist. 1.

(*x*) Obs. ead. Hist. 5.

(*y*) apud Mead. in Append. supra ad n. 9. cit.

(*z*) Obs. 5. cit. Hist. 1.

(*a*) n. 12.

However, the same appearances were not found in all these, as in those four to whom the same poison had been given : and even in many of them was an inflammation of the stomach ; so that it ought to seem less surprizing to you, if I should, by producing two recent histories, show, that the same had existed in the nearest intestines at least, or in these and the stomach at the same time, from some one or other of the vegetable poisons.

The pernicious effects of the berries of the solanum, which they call *furiosum*, have been several times observ'd ; but never more than in a little boy, who died in a miserable manner, in a few hours : his body being disaffected by that celebrated man Schreckius (*b*), had, among other appearances, the intestines jejunum, and colon, very much inflam'd.

And mushrooms, particularly mushrooms of that species which Vaillant has describ'd thus, " the mushroom of the middle size, universally white," did almost the same thing near Paris, as they had formerly done at Rome, while Pliny was writing his history (*c*) ; I mean, " kill'd a family ;" but that nature, assisted by the art of that experienc'd physician Monnier (*d*), who describes all the symptoms accurately, and in order, out of the six, that had eaten them, sav'd five.

The same author, in examining the body of a virgin ; who was the only one that could not be sav'd of all these ; among many other appearances, which you will see in his own relation, found some marks of inflammation in the stomach, about the pylorus : and the intestine duodenum had the vessels of its coats quite fill'd with blood internally ; being, at the same time, besides some slight excoriations, distinguish'd with purple spots, and inflam'd at the upper part thereof.

And I have seen an inflammation of the stomach, and intestines, brought on by a vegetable medicine : but one of the most acrid kind ; and one which, for that reason, sometimes brings on death as certainly as poison : I mean the black hellebore. The history of the case is as follows.

15. A man ; who, if you judg'd from his countenance, did not seem to be fifty as yet ; of a well-form'd body, somewhat fat, and of a good colour, though a little inclin'd to brown (having black hair and black beard) being in the hospital under cure, on account of a melancholic delirium, was about to depart from the hospital immediately, when he took the extract, as it is call'd, of black hellebore. By this medicine he was purg'd to a considerable degree.

But when no mischief was expected ; in the beginning of the night, that is, at the seventh or eighth hour from the time he had taken it, he was attack'd with vomitings, and pains of the belly. Yet these seem'd to be quieted soon after by drinking some warm broth ; that is, about the second hour of the night.

At the fifth hour they again came on ; and seem'd again to be diminish'd ; so that he went to bed before the sixth hour : and he had thrown up nothing by vomiting, but as much of a green kind of matter, degenerating into black, as two or three spoons could have contain'd. When he lay down

(*b*) *Commerc. Litter. A.* 1743. Hebd. 8.
n. 4.

(*c*) *Nat. Hist.* 1. 22. c. 13.

(*d*) *Mem. de l' Acad. R. des Sc. A.* 1749.
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he seem'd to be quiet and easy; at least he made no noise that shew'd him to be in pain: nor any which the patients, who lay in the nearest beds, heard.

At the eighth hour, however, a certain sound, which came from his mouth, was heard by the attendants: at which they running to him, found him already dead.

These things being accidentally related to me; for I was at that time (it being about the middle of December, in the year 1747) teaching anatomy in the hospital; I first enquir'd what kind of extract of hellebore, and how much he had taken. And I found that it was the same which had been generally given to others there; I mean, an extract made from the fresh-drawn roots, bruis'd and prepar'd with simple water: he had taken the quantity of half a drachm; whereas, very frequently, the weight of a scruple was given, and sometimes, to those who are not easily purg'd, more than half a drachm, without any injury.

As I enquir'd, after this, whether the man had taken any thing else that could be hurtful; I was answer'd, that so far was this from being the case, that he had even done wrong by not taking every thing he ought to have taken. For the patient, to whom this extract was given, ought to drink whey after taking it: but he had not drunk his whey; as was certainly known after his death, by the whey being found in the very same place where it had been put for him to drink.

Having learn'd these particular circumstances, relative to the case, I undertook the dissection of the body, at eight-and-thirty hours after death.

The limbs of the carcase not being observ'd to be rigid, or contracted, the belly was open'd. We saw the stomach and intestines to be inflam'd, here and there, even on the external part: so that as the intestine ileum was, in some places, of a natural width, and in other places of a greater or lesser width than natural; where it was narrower than natural, there the coats were very thin, and without any redness: but in other places they were seen to be distinguish'd with red striæ.

Then the stomach, and all the intestines, being wash'd out with water pass'd through them, and open'd; we found the stomach, together with a small part of the annex'd gula, to be, in part, inflam'd; but on the left side only, and not on the right: and the intestines were here and there inflam'd; yet in such a manner, that the inflammation was less slight in the thin than in the thick intestines: if you except the rectum, wherein some spaces were equally and evidently inflam'd, as in the stomach. Yet no violent inflammation appear'd any where through the whole of this body.

The spleen was a little larger than natural: and on its flat surface, that is to say, where it was in contact with the stomach, of a rosy colour; and universally so lax, that the interior parts of it, when cut into, were almost fluid. In the liver was nothing worthy of remark, unless the colour of the bile; which, as was seen through the coats of the gall-bladder, appear'd to be of a green colour, degenerating into paleness.

The thorax being open'd, the lungs were found to be every where unconnected and sound: nor had the heart, or the great vessels, any thing

worthy of remark, except that in the latter there was little blood, and in the former a slight polypous concretion.

When the cranium was cut into, a little bloody serum flow'd down : and soon after we observ'd, that there was but a little blood in the sinusses of the dura mater, and the larger branches that are spread through the pia mater.

The brain, which I was at first surpriz'd at in one who had labour'd under a melancholic delirium, was so lax, that when it was taken out, and laid upon the anatomical table, the very weight of the hemispheres collapsing outwards, made a distraction upon the posterior part of the corpus callosum : and yet it was not then the sixth day after death.

This distraction did not prevent us from distinguishing, upon the remaining upper surface of the same corpus callosum, which was found, that fasciculus which is protuberant in the middle longitudinally ; and which, in this body, did not differ from its usual appearance.

In cutting through the cerebrum soon after, I saw, that neither in the small vessels which pass through the medullary substance, nor yet in the plexus choroides, was blood wanting : but I every where observ'd the same laxity as I did also in the cerebellum, and the medulla oblongata ; and in the glandula pinealis itself ; which appear'd rather bigger and more globular than usual.

But in so great a laxity of the other parts, it was surprizing that the *lacunar*, or roof, which joins the right and left paries of the third ventricle together, was not at all overstretch'd.

16. From the latter part of this history, you would have something to add, by way of exception, to those things that I have already said (e) upon the brain of persons who had been melancholically delirious ; if the man had not seem'd to be recover'd before death. And from the remaining part you have what sometimes happens from black hellebore ; and what is found in the stomach and intestines in this case.

It is asserted by some, and particularly by Gulielmus Fabricius (f); not only that he had read of a prince being kill'd by a medicine prepar'd from black hellebore ; but also that he remember'd a matron, of a pretty strong habit of body, to have died, within six hours, after having taken some pills for her head, wherein a little of the same extract of hellebore had been mix'd ; notwithstanding they had brought on a discharge from the stomach and intestines no more than twice : both of which deaths he, with justice, suppos'd were not to be ascrib'd to the hellebore itself, or to its extract ; which he had made use of very successfully both on himself and others, but to the negligence of those who prepar'd the extract, or the hellebore ; or to their unskillfulness.

Yet what symptoms had preceded these deaths, or what injuries were found in the internal parts of their bodies after death, I do not now remember to have read, either in him or in others.

For as to Ardoynus (g) enumerating the symptoms that arise from this hellebore, and supposing them to be a very great flux of the belly, a parch'd state

(e) Ensis. 8. n. 14.

(f) Respons. ad Doring.

(g) De Venenis l. 3. c. 13.

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of the tongue, a very great eructation, and inflammation of the throat, and other symptoms that are common to some other poisons, and as the white hellebore; in the number of which are strangulation, loss of strength, cold sweat, and spasm from inanition; if we compare the experiment from the observation in question, most of these symptoms agree better with the white hellebore, than the black. And therefore it appears in the man I have describ'd.

But some of them have been observ'd, together with the black hellebore (which he, with great justice, ascribes to the white hellebore) who have died from taking this medicine; as in a woman, who Muralto (b) relates, had very frequent vomitings, and she was agitated with horrible convulsions, wherein she was like a young whelp, which Wepfer speaks of (i) as having died of the same kind; although the dog of which Courtenius (k) speaks, who took four times the quantity of the same hellebore, did indeed have intestinal discharges, singultus, suffocations, and even to a certain degree pains; and yet escap'd nevertheless.

But be this as it will, you have heard what happen'd to the man who took black hellebore; as you likewise have heard what appear'd in the dissection of his viscera after death. For you might have learn'd from the dissections of the whelp, and the woman spoken of above, that after the hellebore the stomach has been found to be red, and even to a certain degree roded, and of a black colour.

But what mischief had been done to the stomach and intestines of the man body, by black hellebore, you perhaps could not have imagin'd; except from the present description. And if the mischief had been imagin'd, as it seems to have done, from this circumstance, that the man, after taking the extract, did not drink a large quantity of whey, as he always did, and as is order'd, even by Hippocrates (l), who order'd hellebore; hence then, likewise, those things we have said above, that the hellebore to the advantage of drinking whey, in persons who have taken it, are confirm'd.

And neither the quantity, nor the state, of the blood, seem to have been dispos'd to inflammation; as it was in small quantity, and solid in consistence. Yet I would not deny that the effects of poison are encreas'd by the disposition of the body; as I readily acknowledge, that a poison may be sometimes generated by the very disposition of the body itself.

17. And indeed the ancient physicians also (n) acknowledge, "that the same disorders are produc'd from taking down the stomach, as that a deadly poison, and from a corruption which has its origin from the body:" that is to say, this corruption may be so violent, as to equal both the quality and the strength of the poison."

(b) Sepulchr. l. 3. S. 8. Obs. 6.

(i) l. 4. S. hac 10. in Additam. Obs. 8.

(k) Saggio delle Tranfaz. trad. dal Dereham T. 3. c. 9. §. 6.

(l) De Intern. Aff. l. 2. c. 45. apud Mes-
sineil.
(m) n. 11.
(n) Vid. Gall. l. 6. c. 12. e. 5.

Nor were the greater part of the succeeding physicians averse to this opinion. Which I believe no observation can more evidently confirm than this, which was formerly communicated to me by Giovanni Francesco Cicognini, who was, while living, an eminent and experienc'd surgeon at Forli; and who having learnt the experiment at Florence, made it after the manner of Redi.

18. A little son of Francesco Ridolfi, a painter at Forli, being emaciated and extenuated by a tertian fever, was at last carried off by dreadful convulsions; wherewith he was attack'd.

Upon opening the abdomen, the intestines appear'd to be drawn up to the mesentery, which was contracted; their coats being somewhat rigid, and in a manner dried up. And these viscera, as well as the stomach, contain'd a great quantity of æruginous bile; by the contact of which the scalp was ting'd of a violet colour.

This scalp, tinctur'd, and even dropping, as it was, with the same bile; he impress'd slightly upon the flesh of one, and another, pigeon; in such a manner, however, as to leave the bile remaining within the wound: in consequence of which, they both died, in tremblings and convulsions, soon after. And indeed, a piece of bread mix'd with this bile, being taken down by a cock; this animal also died in a similar manner.

19. Although that formerly very excellent physician, and Paduan professor, Jo. Dominic Sala (*o*), asserted that internal poisons "are rarely generated in bodies, in other respects of a good habit, and that had not committed any errors in their method of living; and very rarely so suddenly that the patient does not foresee it from other parts, or from other accidents;" yet in this very circumstance, of not denying that this might happen rarely, or very rarely, he differ'd from those physicians that were spoken of above (*p*); who did not doubt (*q*) but, on the appearance of symptoms of poison in the human body, "those who had taken in poison might easily be distinguish'd from those who were affected from some other cause:" that is to say, from a poison generated within the body.

For they said, that those who, by their own nature, abounded with good juices, and "were like healthy persons, had taken poison."

It is certainly of some importance, in forming such a judgment, whether the man in question was in health, or not. For in Severinus Falckius; to use examples taken from the Sepulchretum (*r*); neither the vomiting of every thing taken in, nor the stomach being internally red, and almost excoriated, could raise a suspicion of poison having been given; especially in the last stage of life: as the scurvy and irregular fevers, and after that, lost appetite, and very severe pains of the stomach, had long been troublesome.

On the other hand, in a young man for whom the opinion of Sala was ask'd; besides other symptoms of poison having been taken, this circumstance, that he was of a good habit of body, and enjoy'd good health, had

(*o*) Vid. Sepulchr. l. 3. S. 7. in Schol. ad Obs. 1. & 2.

(*p*) p. 17.

(*q*) Galen. c. 5. ibid. cit.

(*r*) Obs. 1. & 2. modo cit.

so much influence upon Sala's opinion, that he never soften'd his suspicion of poison, till, in another relation of the case, it was said that he was a valetudinarian; and of a bad habit of body.

Yet, as he was a prudent man, he would not pronounce, in his first opinion, that poison had been given; nor in his second, that it had not, for a certainty.

And indeed, although the body abounds with good juices; that very abundance is a reason why a man "ought to have a suspicion of his own 'happiness;'" that is to say, lest "every thing be again carried backwards, 'by a kind of ruin:'" which are the words of Celsus (s), who follows the monitum of Hippocrates (t). And we know that wicked men, who attempt to poison others, frequently seek for the occasion of weak health; that there may be no suspicion of their wickedness: and this is shown by one of our observations above (u): and I have elsewhere observ'd that it has been done before in ancient times.

Thus, that most crafty woman, Agrippina (x), who was more worthy of her son than of her parents, having determin'd to take off her husband by poison, and he being seiz'd with ill health, did not think that she ought to omit this occasion which was offer'd her: and the same woman made use, moreover, of other fallacies; not unusual among persons who attempt to kill by poison; in order to hide her wickedness.

For with this view, I suppose, it was that she pour'd the poison "into the 'delightful food of mushrooms;'" her husband "being very fond of such a 'dish' (y); so that he might seem, by eating much of them, to have hurt himself from the too great quantity; and also from some pernicious mushroom, which was thrown among the good ones, as if by the error of the cook: whether, as it happen'd, "he was troubled with pains;" or "a violent vomiting," or "a purging;" or even "a fever" should trouble him most; for that the latter of these "continu'd with him many years, even "to his dying day," is hinted by L. Annæus Seneca (z).

If you take notice of these, and other such cases, with me; you will be able, more easily, to distinguish the crafts of wicked men, who frequently impose upon physicians in the cases of some patients: or, at least, you will be led to suspect them; and I wish it may be before it is too late: and you will, at the same time, perceive, not only by reason, but by observations also, that some certain symptoms, as thirst, and some certain disorders, as fever, which are said by many to attend when a poison is inbred, may also attend when poison has been administer'd; and even may have preceded.

Therefore Sala, whom I have already commended, although he denied that poison "is generated without a fever;" yet did not, for that reason, in his second answer, ascribe so much to this symptom, as to affirm that the young man had died from poison generated within. Nor, indeed, are we

(y) De Medic. 1. 2. c. 2.

(t) Sect. 1. Aph. 3.

(u) n. 6.

(x) Vid. Tacit. Annal. 1. 12.

(y) Vid. Sueton. de duodec. Cæsarib. 1. 5.

c. 44.

(z) Apocolocynt.

under a necessity of affirming the same, because no unusual odour or taste, nor any pain, is perceiv'd in the mouth, or fauces, in swallowing, or after swallowing.

For to pass over the promise of that wicked king Perseus (*a*), of poison, which could not be detected by any sign whatever, "either in being given, or after being given;" and to omit here other things, also, that might be said; you perceive sufficiently, from the observations I have related to you above (*b*), that poison has been taken in without any mark of it having been perceiv'd.

And, on the other hand, you see, that, from any animal's being disorder'd by eating what has been thrown up by vomiting in these suspected cases, it is not to be inferr'd that this vomiting was from poison that had been taken in; and not from an in bred poison; as the last-propos'd observation (*c*) clearly demonstrates.

20. But that even the appearances found in the stomach after death may sometimes impose upon us, we are taught by that circumstance which I just now took notice of (*d*) in regard to Falckius. And to this you will add what has been transferr'd into the Sepulchretum from Ballonius (*e*), and from Riolanus, in like manner (*f*), when, in a body where poison was suspected to have been given, the stomach was found to be beset with exanthemata; and the physicians were just upon the point of absolutely determining and asserting, that these exanthemata were owing to poison; if they had not been inform'd that they were owing to the measles; which had begun to break out on the skin, but were repell'd by reason of weakness in the patient, and occupied the stomach: and the same suspicion, in many who died suddenly, has arisen from hence, that the fundus of the stomach, and particularly the left part of it, was black, both internally and externally; whereas this was not to be attributed to poison, but to the blood stagnating there, within the small veins which belong to that branch formerly call'd *vas breve*.

But, on the contrary, all spots observ'd in the stomach are not to be despis'd. And we ought to expand the stomach betwixt our eyes and the light, after opening it. For, by this means, that stomach, which seem'd only to be sprinkled here and there with some spots, was found, as Ballonius (*g*) relates, to be perforated with very small foramina, which are marks of poison: although even then I should think we ought to determine by other marks whether the poison was external or internal.

And, indeed, sometimes, not only a manifest, but a large ulcer may be found in the stomach; the first symptoms of the origin of which may seem to have been the consequences of poison that was taken in; and yet the matter may not be clear from doubt.

Thus in a young man spoken of by Fabricius Hildanus (*h*), a pain of the stomach had begun first after a plentiful meal: and this pain increasing gradually from that time, and becoming more severe, so as to kill the patient,

(*a*) Vid. Liv. Hist. l. 42.

(*b*) N. 7.

(*c*) N. 18.

(*d*) N. 19.

(*e*) Sect. hac 10. Obs. 4. § 10.

(*f*) L. 3. S. 7. in Schol. ad Obs. 10.

(*g*) Sect. ead. Obs. 17. § 1.

(*h*) Ibid. Obs. 5. cum Schol.

a large ulcer was found in his stomach after death ; extending itself from the upper orifice of the stomach, downwards, into the stomach : which ulcer the parents accounted for from poison having been given : but Fabricius thought it more probable, that the ulcer had begun from some little sharp bone being infix'd in one of the rugæ of that orifice : for if the ulceration had been made by poison that was taken in ; this, says he, “ would have existed rather in the fundus itself, than in the orifice of the stomach.”

Yet those who should chuse to dissent from Fabricius, might take objections from the cases of those two girls who were suspected to have died by poison, and in one of whom Joannes de Muralto (*i*) found five black marks, as if they had been burnt in, near to the same orifice ; and in the other of which Peter Paaw (*k*) found that very orifice eroded in two places : and, to say nothing of a man open'd by the same Paawius (*l*) on account of the same suspicion, (for, besides the substance of that orifice being eroded, he had also the remaining part of the stomach's internal surface eroded also) they might, however, produce the instance of a dog spoken of in the histories publish'd by Wepfer (*m*) ; which having taken arsenic, and died the next day, shew'd, when dissected, “ the surface that lay near to the œsophagus, in the stomach, “ to be red and inflam'd ; but shew'd no mark of inflammation about the “ pylorus, or in the fundus of the stomach.”

Finally, that it may better appear how difficult it is to judge in this matter, it may sometimes seem, in cases of this kind, that the poison itself has been found in the stomach ; as in a matron spoken of by Bened. Silvaticus (*n*), “ that fine powder, of a cineritious colour, adhering to the ulcerated part “ of the stomach, was taken for the most clear and certain mark of poison” having been given : or, as in the girl of Muraltus just now taken notice of, that other kind of “ sandy ” powder, which subsided from the fluids found in the stomach, and receiv'd in a clean vessel.

But unless the powder be found in such a quantity as to be capable of being well examin'd by skilful persons, and known to be poison ; or, unless the particles of it, adhering to the eroded coats of the stomach, are of such a kind as easily to discover themselves ; as that *gilla* which Heersius (*o*) found adhering to them ; or as the little pieces of white arsenic which Salmuthus (*p*) saw adhering to them, and just pull'd away ; or unless, as in the woman, also, of whom is the first observation of this letter (*q*), they had other circumstances whereby to determine ; it will not be possible to pronounce any thing certain therefrom.

21. And as often as I consider with myself all these things, and others that Etmuller ; I mean the son ; has consider'd in a very learned and judicious manner, in a programma publish'd at Leipzig in the year 1729, shewing how difficult and dangerous it is to determine any thing certain in questions of this kind ; I say, as often as ever I consider these things, so often do I think that I acted very justly and properly, when, in some dissections, which I

(*i*) L. eod. 3. Sepulchr. S. 8. Obs. 7.

(*k*) L. 4. Sepulchr. S. hac 10. Obs. 4. § 7.

(*l*) Ibid. § 8.

(*m*) Ibid. in Additam. Obs. 13. Hist. 12.

(*n*) Ead. S. 10. Obs. 5.

(*o*) Sepulch. l. 3. S. 8. Obs. 8.

(*p*) Ibid. Obs. 5.

(*q*) N. 3.

might have given you here, but have written to you formerly (*r*), I would not pronounce whether the poison was generated within, or taken in from without.

Yet in that woman, in whom I found not only the stomach and the intestine duodenum, but also the œsophagus, eroded (*s*); I should have been able to take upon me to say more, if it had been certainly known that there had been no vomitings, whereby the poison, which was perhaps in-bred, being thrown up, had, by stagnating in some part of it, happen'd to injure the œsophagus.

It will not, therefore, be a slight proof of poison having been taken, that there are erosions of the stomach, if they are join'd with no vomiting, and nevertheless with an erosion of the œsophagus; especially if they be found in a person who, being in good health, and having committed no error in his method of living, was suddenly seiz'd, after taking something into the stomach; particularly any thing of an unusual taste or smell; with pains of the stomach, or anxieties, and other symptoms of poison being taken in, and died within a very short time: not a slight conjecture will be drawn from all these, I say, or the greatest part of them, being join'd into one.

But the case will be certain where the poison itself shall be found in the stomach, or in the neighbouring intestines, in such a quantity as to be easily known. See also the marks of Hoffman (*t*), on occasion of some histories that well deserve to be transferr'd into the Sepulchretum: for they propose both the symptoms and the dissections in a proper manner, by no means omitting the reasons, from whence, among the marks of poison having been given, and particularly of arsenic, that are common to many, we may understand that poison was not given to one, and was given to others.

But, in regard to that principal testimony of poison having been given; I mean, a portion of it found in the viscera; as, according to the different state of the poisons, their very small quantity, and their mixture with other things, it does not often occur; we must, therefore, take our evidences from other circumstances; some of which, as they belong to the judges of capital affairs, are omitted by me: but one which concerns physicians must not be omitted; though of itself obvious, and observ'd once or twice by me in the course of my enquiries.

For, besides that which I saw in the year 1711, and took notice of above (*u*); I mean, when three who ate of the same dish were all affected with symptoms of poison soon after; it had already happen'd before, in the year 1709, that many of my fellow-citizens, whom I knew to be familiar with each other, and to be accusom'd to feast together sometimes, call'd me to them within a few days; and, suspecting that there was some one common cause of their falling sick at one time, I found, by enquiry, that since the time they had all din'd together last, they had begun, at first, not to be very well, and soon after to be ill.

I ask'd whether there were any others at this dinner besides themselves.

(*r*) Epist. 29. n. 18. & seqq.

(*s*) Ibid. n. 20.

(*t*) Medic. Rat. Tom. 4. P. 3. S. 2. c. 8.
in Enarrat. Morb. Obs. 2, 3, 4.

(*u*) N. 7. & seq.

And having heard that there were, and that all of them, not one excepted, now were ill of the same disease; and yet that none of them had eaten immoderately, or any-thing that was not quite wholesome; and observing that few persons were diseas'd in the city that autumn; I thought it was scarcely to be doubted, but something of a deprav'd nature and similar to poison, had been mix'd up either in the foods or the liquors which had been made use of at that dinner: though, probably, owing to some accident.

But easy as it was to conjecture this in general, so difficult was it, either from the symptoms of the patients, or from an accurate and often-repeated enquiry, to learn what ingredient this was.

For the symptoms were different in different persons, according to the various age, disposition, and temperature, in different bodies; although in many of them, among other symptoms, were an intestinal flux, and tormina; and one of them discharg'd pure blood from the intestines, without tormina. But that I might have the best opportunity of enquiring into the truth, I undertook the more willingly to attend, without any reward, to the cure of the servant-maid who had dress'd the dinner, and eaten the remains of it; besides the person who gave the dinner: for both of them were greatly affected; and the servant-maid very greatly indeed.

And though I frequently said to the maid, how much more easy the cure would be, if she would just tell me alone what she had done by mistake, or what she could conjecture had been done by any-one else; I could never get any-thing out of her but this only, that the more she thought of it, the more ignorant she was in respect thereto.

This, then, being the state of the case, I was necessarily oblig'd to treat every person accordingly as they were troubled with this or that symptom, in a greater or a lesser degree. Some of them were sav'd by a short and easy method of treatment; but the others by a long and difficult course: so that in some the cure was continu'd for the space of two months; and in him who discharg'd blood from the intestines, for the space of four months.

One out of them all, who had made light of the disease for a very long time, was carried off on the nineteenth day from the time of taking to his bed, by a fever, which was attended with a singultus, convulsive tremors, and other malignant symptoms: notwithstanding his senior physician and myself gave him all the assistance in our power.

22. The only way that was now left of investigating the unknown cause of so many diseases; I mean, anatomy; it was not possible, for many and various reasons, to have recourse to. And some of the same reasons, also, prevented the dissection of another person, who it was conjectur'd, on pretty good grounds, had been taken off by means of opium being given in too great a quantity, by a mistake of the apothecary. Yet this dissection would now have been the more agreeable to me, because I see that the appearances observ'd in brute animals, which were open'd after a very large dose of opium being given them, by the very experienc'd Sprengel (*x*), do not very well agree with those things that the celebrated Mead (*y*) had observ'd in a dog.

(*x*) Exper. circa varia venena, &c. Exp. 15. & seqq.

(*y*) Traët. de Venenis Tent. 5.

However, I would not have you expect a word from me, in these letters, in regard to the detestable abuse of opium in the hands of wicked men. For such things as these, though they ought not to be unknown to physicians for many reasons, yet ought never to be committed to public writings, but agitated in private conferences; lest that which is necessary to be known, in order to find out the proper method of cure, should be so abus'd by wicked men, as to give occasion, from thence, to kill secretly and with impunity.

Wherefore, Galen (*z*) so far blames Orpheus surnam'd the Divine, Horus Mendesiuss the younger, Heliodorus the Athenian, and other authors of books upon these compositions, as not even to grant that the knowledge of them is, at least, necessary to physicians, in order to enable them to assist those who have taken them. Be this as it will, it would certainly have been more prudent for some, in other respects very great physicians, who have succeeded him, to have suppress'd many things upon poisons; and not to have made them public in letters, or even in books that are read universally.

23. But I do not remember that any dissections have been made by me, or by my friends, of persons who have died of the bite or wound given by a venomous animal; if you except those which relate to the bite of a mad dog, and have been already communicated to you by me (*a*). For, to use the real words of Celsus (*b*), "Italy and the colder regions have the advantage of being preferable in this respect also, that they produce less terrible snakes" than the hot countries.

Nor is the case much different, in general, in regard to venomous animals that are less than snakes: and it is certain, in regard to those less hot parts of Italy in which I have been conversant, that those persons did not say true things, who related the following to Boerhaave (*c*): "That in Italy, where there is a great number of scorpions, no person comes into an inn, but the host immediately points out to him a bottle full of the oil of scorpions; that he may instantly anoint the wound therewith, if he has had a wound inflicted by that animal, in order, by this means, to escape the danger of death."

Yet I would not have any foreigners suppose them to be so rare in the regions of Italy, as Pliny seems to have asserted (*d*). "The Psylli," says he; that is, a people of Afric, whose bodies were suppos'd to be natural antidotes against the poison of serpents, and other venomous animals; "who, by bringing in the poisons of other regions, have fill'd Italy with foreign evils for the sake of their own lucre, have endeavour'd, also, to import these scorpions: but they could not live within the region of the Sicilian atmosphere. Yet they are sometimes seen in Italy, though harmless."

If those things which follow upon the subject of common scorpions would suffer me; I should much more readily interpret Pliny so as to suppose him not speaking of these, but of the wing'd scorpions of Africa, whereof he had spoken last: and this on account of what he had said just before.

But as these things do not suffer me to interpret him thus, I suspect that

(*z*) De Antidot. l. 2. c. 7.

(*a*) Epist. 8.

(*b*) De Medic. l. 5. c. 27. n. 10.

(*c*) Prælect. ad Instit. § 1132.

(*d*) Nat. Hist. l. 11. c. 25.

something is wanting : at least, those who wrote at Rome before Pliny, Lucilius and Cicero, would not have spoken of a rare animal by way of example in this manner : the former of these authors says (e), " like a scorpion bereft of his tail ;" and the latter (f), " We see that snakes creep, that ducks swim, that blackbirds fly, that oxen make use of their horns, and scorpions their stings : " but Cicero would rather have said, *vespas aculeis uti*, or " that wasps make use of their stings," as unskilful persons had formerly publish'd it ; either because they did not know what to make of the word *nepa*, which is an African word for a scorpion ; or, at least, because they were ignorant that Nonius (g) had the two last words of Cicero in the very manner I have produc'd them : and, indeed, that he could not have produc'd them otherwise, according to the order of writing, and agreeably to the sentiment.

But if any one believe, however, that Pliny asserts the scorpions in Italy to be " harmless ;" this is so for the most part : nor do I remember that in the cities where I have resided, even the most crowded cities, a physician, or a surgeon, was ever call'd to cure a wound inflicted by a scorpion ; and still less that any one ever died of such a wound, so that the effects of the poison could be enquir'd into in the body after death.

And, indeed, you will see that the same thing is confirm'd by our Falloppius and Vallisneri. For the latter has written (h), that " a kind of innocent poison " comes forth from the sting of our scorpion ; and Falloppius (i) has said, that " in our region, where scorpions are less venomous," a tumour does not arise in the part which is wounded by them, as in the hot regions ; but " only pustules, and small tubercles, similar to the small-pox."

And that we may prove the same thing by the authority of physicians who have liv'd in Italy, either in times, or in places, or in both, more distant from us than those two ; do you imagine that Scribonius, if he had seen noxious scorpions in Italy, would have written in this manner (k) : " In Africa, or wheresoever the scorpions are noxious : " and that Cornelius Celsus (l) would have plac'd the poison of the scorpions " among the foreign poisons, and those that were somewhat more pestiferous " than our own ?

And that he did so place it, not because the scorpion was foreign, but because the pernicious scorpion was foreign, seems to me to be sufficiently prov'd by those words of his which follow after having recounted many remedies (*) : " Yet I know physicians who have done nothing else against the bite of a scorpion, but let blood from the arm."

But Redi was distant from me in place, not in time ; and Gentilis is now distant in place : both being Tuscan physicians. The first of whom (m) affirm'd the same as Pliny, for this reason, that he had a hundred times seen the sellers of scorpions thrust their naked hands into the sacks that

(e) Ex Satyr. l. 30. n. 23.

(f) De Finib. l. 5.

(g) De Propr. Serm. in *Nepa*.

(h) Opere Fis. Med. Tom. 2. P. 1.

(i) Tract. de Tumor. c. 3.

(k) Compos. Medic. 164.

(l) C. 27. cit.

(*) Ibid n. 5.

(m) Esper. int. agl. Inf.

were full of them ; and often have blows from them : and yet never saw the least sign of poison follow thereupon ; although it was the very height of the dog-days when these things happen'd. And the other (n), that fatal disorders scarcely ever arise from the bites of scorpions, except in Africa. For that some persons indeed have died by being bitten with the Italian scorpions ; but that very few examples of this kind are related by the writers of natural history.

24. That learned man produces two examples ; one from Ferrarius, and the other from Lanzoſus. In both of them a vomiting, and even in one of them a volvulus, was fatal within a few hours. And I think it will not be improper to add other examples, as many as occur while I am writing, which perhaps would have ended fatally, if they had not been timely prevented by remedies. And I shall produce them the more readily, because most of them happen'd at Padua.

Our Cortuſus being call'd to a fellow-citizen of his, who had been wounded by a large ſcorpion, “ and was already ſeiz'd with a deliquium animi, re-call'd him to life, in a very ſhort time,” by the external aſſiſtance of a powder, which he had receiv'd from Mattheiſolus (o). Benivenius (p) cur'd, in a little time, a ſervant-man, who had been inſtantly thrown into a very cold and profuſe ſweat, by a ſimilar blow ; by giving him theriaca in generous wine.

Peter a Caſtro, a famous phyſician at Verona, had his fore-finger wounded by a ſcorpion ; in conſequence of which wound, pain and coldneſs ſoon ſeiz'd upon the whole arm ; when he, having found but little effect from other remedies, was cur'd by that which his friend Rhodius (q) has tranſmitted down to us in his writings : adding this alſo, that the pain, nevertheleſs, return'd in the following year, at the ſame time, together with a *tumor phlegmonodes* of the finger.

But he ſays, that he had ſeen ſome “ bites of ſcorpions to be of importance, by reaſon of their tumour, and their pain,” at Padua. And indeed Valliſneri himſelf, who, as I have ſaid above (r), had acknowledg'd that the poiſon of theſe animals is in a manner harmleſs among us, finally changes his opinion in ſome meaſure ; in an alphabetic ſpecimen of medical and natural hiſtory (s), which he left imperfect ; and affirms that this poiſon is indeed “ harmleſs in the winter, but that in ſummer it is deadly, even in “ our regions.”

Of this he has, however, produc'd only one example ; which is an inſtance of a young woman, who, being ſtung in the neck by a ſcorpion, in the time of the dog-days, “ had her limbs gradually become cold :” nor was any other remedy of advantage, out of the many made uſe of, but the oil of the great duke of Tuſcany, which is call'd *controveleni*, applied internally and externally.

(n) Annotaz. alla pag. 66. v. 23. della Lett. Filoſ.

(o) Vid. hujus Comment. in Dioſcor. l. 6. c. 29.

(p) De abditis Morbor. cauſ. c. 56.

(q) Cent. 3. Obſ. Med. 90.

(r) n. 23.

(s) Opere Tom. 3. P. 4. alla voce *Scorpione*.

But I would first have you take notice, that these were not fatal examples in the end: and in the second place, what are so few examples to innumerable others, which are quite different therefrom? What is this last to so many others that I have pointed out (†) of Redi's, at the same very hot time of year?

For, although I grant that this poison becomes more acrid at such a time of year, and that the bodies of men are more liable to be injur'd by it; yet in the month of October happen'd the case of Peter a Castro, and about the end of June that which is describ'd by Lanzonus (u), in the words of a physician who had been present.

And though this, and the other also, of Ferrarius, were fatal by means of vomitings; yet in the latter, the scorpion had crept into the mouth of the boy while asleep, and had wounded it: and in the former, the extremity of the intestinum rectum, of a woman who labour'd under a chlorosis, had been struck by this animal, while she was sitting down, and discharging the fœces from her intestines.

And how much it tends to increase and accelerate the noxiousness of the poison, if not only the wounded body be very tender, weak, and diseas'd; but the part itself also is more soft, and endow'd with a more exquisite sense; you can, of yourself, very easily conceive: and indeed, unless we do admit this supposition, it is somewhat more difficult to have any idea, why the wounds of scorpions are not equally pernicious to all persons: and not only amongst us, but among other nations; if you except Africa, and places that lie in an equally hot climate.

25. For when I attend to the experiments which have been made at Montpellier, I am easily induc'd to believe, that the wounds of scorpions are, for the most part, harmless there also; as they are among us. Nor do I only speak of the experiments which were made there, by Courtenius (x), in the year 1679.

For as to the whelp being prick'd by many scorpions in the tongue, and being struck by them, more than once, upon the abdominal muscles, after the common integuments were taken off; the sting being press'd against the part more strongly, even by art, and the poison being press'd out of the subjected vesicle into the wounds; and yet the dog's receiving no injury therefrom; nor yet a pigeon, which was frequently wounded, in the same manner, by a scorpion: and, on the other hand, that a mole, whose side had been prick'd by a scorpion, immediately died convuls'd: you may assign this reason for the difference, that the whelp and the pigeon were wounded by weak and languid scorpions; as it was in the beginning of January that these experiments were made; but that the mole was wounded by a strong and keen scorpion: as this experiment was made about the middle of July.

I, therefore, chiefly have my eye to those experiments, which were made there by the celebrated Maupertuis (y), fifty years after. Out of nine dogs, three little chickens, and one mouse, which the scorpions had wounded, one

(†) n. 23.

(u) Eph. N. C. Dec. 3. A. 1. Obs. 20.

(x) §. supra ad n. 16. cit.

(y) Mem. de l'Acad. R. des Sc. A. 1731.

dog only died convuls'd; and he at five hours after being wounded, and after vomitings being frequently repeated: the twelve other animals receiv'd not the least injury therefrom.

Yet in these animals the same places had been wounded, to all appearance, within a few days; and certainly by scorpions of the same kind, and in like manner strong, acrid, and fierce: so that no cause of the difference can be deduc'd from hence, why one dog, and no more, died; especially as this was wounded only by one, and some of the others by many scorpions; and even a much greater number of times; and had the sting fix'd more deeply into them: and this promiscuously, both by males and females; and in like manner such as were fresh caught; so that we are not at liberty to suppose the cause of this difference to consist, either in the variety of the sex, or in the poison, which was perhaps quite consum'd in former blows, as Redi (z) has justly conjectur'd; and not only in regard to vipers, but also in regard to the scorpions of Africa.

Yet it may be suppos'd to consist in several different circumstances; and perhaps in some one of them that are pointed out by Maupertuis. But because it happens so rarely that scorpions bring on any great injury; I should more readily believe, that it is necessary for many of them to conspire together to bring it on: or, perhaps, that some other ought to be added, as the most considerable. I will illustrate my meaning by an example.

26. Among the ancients was a little flying animal, "whose Roman name "is *afilus*;" to use the words of Virgil (a): "the Greeks, by translation, "call it *æstron*." That the same has been call'd by the Latins "*tabanus*," also, is shown by M. Varro (b); but still more clearly by Pliny (c). Whether this animalcule be the same that is call'd by us *tabanus*, horse-flie, or gad-bee, I shall certainly deny if you ask me: but whether it be what the Tuscans still call *afilus*, I shall be in doubt.

For certainly, either that is not the *afilus* of the ancients, or does not always do the same thing that the ancients have describ'd to us; I mean, that they excite the oxen, which they wound, into madness. And this is true, that the very excellent Reaumur (d) thought he ought to enquire into the reason, why this effect sometimes follows, and sometimes does not.

Therefore, as he, contrary to Vallisneri (e), acknowledges no acrid juice in this animal, which it leaves in the wound; he does not, of course, at all enquire whether it leaves more at one time, and less at another: neither does he believe that the cause of the difference is to be accounted for, from the sting being fix'd in more or less deeply; and for this reason, that it is neither more slender, nor is fix'd less deeply than the goad of herdsmen; who often pierce through the skin of oxen, but never excite them to fury by that means.

(z) cit. supra ad n. 23.

(a) Georg. l. 3. v. 147.

(b) De Re Rust. l. 2. c. 5.

(c) Nat. Hist. l. 11. c. 28.

(d) Memoir. pour serv. à l'Hist. des Insect.
Tom. 4. Mem. 12.

(e) Opere Tom. 1. P. 4.

He therefore supposes that when the sting of the asilus happens to prick some pretty large subcutaneous nerve, the ox is then furious; that when no nerve of this kind is prick'd, the ox is not furious. I however, if I were even very greatly practis'd in the dissection of this animalcule, would not even then take upon me so much as to pronounce any thing against either of these gentlemen; who have not had their equals, in the very difficult investigation of the history of insects, in this age; and whose dissections deserve the most mature consideration: but I should rather endeavour, as my respect towards the memory of both requires, that if it were by any means possible, both their opinions might be compounded together; having a regard to a pretty thick nerve being prick'd, and at the same time to an acrid juice being instill'd into the wound; if I could possibly, at any time, find that such a juice did proceed from the asilus into the wound: and by that means entirely root up a certain scruple from my breast, in supposing it very difficult to happen, that the goad of the herdsmen also, should never light on some pretty thick nerve, and drive the ox into a fury.

But now transferring the conjecture, of this very great man, from the asilus to the scorpion; in regard to which we may compound both the opinions; I suspect that very considerable disorders may probably follow from the stroke of this animal, when the wound is inflicted upon any pretty thick nerve; or any other part of exquisite sensation; and at the same time a very acrid poison instill'd into the wound.

And indeed, not only the animals that I have taken notice of (*f*), as having died from hence, but those also that Redi (*g*) kill'd by means of an African scorpion, perish'd in convulsions: and that woman also, of whom we spoke above (*h*), was convuls'd; and whatever other symptoms appear'd in her, and in others of the human species likewise, who did not die, may easily be explain'd upon the hypothesis of convulsions: and it is the laudable opinion of the celebrated Mead (*i*), that other poisons also, communicated by the stroke or bite of venomous animals, are injurious, by means of the nerves in particular.

27. But in regard to a poison, also, being infus'd together with the sting, there is no longer any doubt. For although, after Pliny (*k*) had asserted "that the stings of scorpions are perforated with a slender tube, through which the poison is infus'd; and "that Apollodorus (*l*) affirm'd this "poison to be of a white colour, when effus'd by them;" Galen (*m*) arose, and asserted, "that no foramen could be seen in their sting;" and therefore, "that it was either a very small quantity which they injected, or nothing "at all:" and, indeed, though Redi (*n*) in a very large scorpion, that is, an African scorpion, could not see any foramen, notwithstanding he made use of the most exquisite glasses; yet this author has confirm'd; not only from Aretinus, an ancient writer, (who might have copied from Pliny) but from many of his own observations upon that same scorpion; that a white fluid is dis-

(*f*) supra n. 25.

(*g*) *Especr. supra* ad n. 23. cit.

(*h*) n. 24.

(*i*) *Introd. ad Expos. Mech. Venen.*

(*k*) *Nat. Hist.* l. 11. c. 37.

(*l*) *Ibid.* c. 25.

(*m*) *De Loc. aff.* l. 6. c. 5.

(*n*) *Especr. cit.*

charg'd from the sting. But others have seen the foramina; not to say the foramen; among whom was Vallisneri (o) in particular, who publish'd this discovery more than once after that, and show'd why they were not seen by Redi, who sought for them in the very extreme point of the sting: and also why they ought not to have been in the extreme point; that is to say, lest if the canal of the poison should be brought on quite to the extremity of the sting, it should not only prevent the necessary slenderness and firmness of the sting, but should become liable to be stopp'd up by any the smallest particle of matter wherewith it should meet.

And lest you should doubt, whether there are foramina in the scorpions of our country also; and these not in the extreme part of the sting; Ferdinand Anthony Ghedini, a man of a most elegant genius, not only wrote to me in the year 1707, by what means he saw them in these scorpions; but Vallisneri has publish'd the letters of Ghedini, which I had communicated to him.

There are these peculiar circumstances in Vallisneri: that the sting has three surfaces like a triangular pyramid: that in each of these is a single foramen: that through these foramina a very fluid humour is discharg'd: and that this humour is carried by a small canal, which passes through the internodes of the tail, into the extremity from whence the sting shoots forth.

You may enquire, in those foreign and larger scorpions, from whence he seems to have taken this description, whether these peculiarities are perpetual; and this moreover, what is the internal structure of the last internode.

For besides the vesicle which Coiterus (p) formerly referr'd to, by saying that, "under the sting of the tail, wherewith the scorpion strikes, a bladder full of poison lies hid;" it is very natural to suppose, that some muscular fibres are contain'd there, whereby the poison may be press'd out. For the external part of the internode cannot, of itself, do that; as it is of a horny nature: and in an African scorpion, as Redi (q) has experienc'd, it does not yield to external compression.

And under that crust, as we see in the claws of crabs, it must, of course, be that the muscles are included; whereby, as well as the other internodes, the last also may be mov'd: and so some fleshy, or tendinous expansion, reaching within the last internode, might, by a stronger contraction than that whereby it moves this internode, compress even the vesicle.

28. But this poison is far less powerful and strong in the scorpions of this country, and of other regions, not very hot; as, for instance, Montpellier; than it is in the African animals of this species. Wherefore, the violent symptoms which arise from thence, in Africa, do not occur frequently among us; and even are very rarely met with, as has been shown above (r): so that unless many causes; and among these, perhaps, the chief, that is to

(o) Vid. loca supra ad n. 23. & 24. in.
dicata.

(p) Obs. Anat. ex diversis brutis.

(q) Esper. cit.

(r) n. 23. & seqq.

say, the pricking of some pretty large nerve, conspire together in one person, it seems to be innocent, and without effect.

And when we suppose this, we naturally come down, with the celebrated Maupertuis (*s*), to that suspicion of many remedies which are recommended against the bites of scorpions, having seem'd to be of advantage for this reason, that they have often been made use of upon such men as have had a wound inflicted upon them indeed, but an innocent poison (if I may be allow'd thus to speak) instill'd thereinto.

Amongst these remedies, you know that, from the most ancient times, one, of the efficacy of which that celebrated man, in particular, doubts, and which is taken from the scorpion itself, has been recounted.

"The scorpion," says Celsus (*t*), "is the best remedy for itself, either rubb'd down and laid upon the wound, or upon burning coals, that the wound may be fumigated."

But the doubts of this gentleman, whom I have commended, seem to be confirm'd by this fumigation having been applied to that woman who was spoken of above (*u*), without effect; as she, nevertheless, died of the wound of the scorpion: and also by the circumstance of the scorpion itself having been bruise'd, and applied without effect to the wound of Peter a Castro; whose case we have also said (*x*) to be similar to those of persons bitten by the tarantula in this respect also, that in the following year the pain return'd at the same time.

For this was observ'd by Baglivi of those who were wounded by the tarantula (*y*): and this author has also asserted (*z*), "that it is clear from observation, that those who are prick'd by the scorpion, in la Puglia, suffer almost the same symptoms as if they were bitten by the tarantula." But I have not recited those symptoms and deaths above, as I have excepted the very hot parts of Italy. He, moreover, produces the dissection of a rabbit which was kill'd by the tarantula (*a*): and does not scruple to assert (*b*), that, in persons bitten thereby, "many symptoms seem to depend upon a deprav'd imagination."

But these, and other circumstances relative to the tarantula, I hope we shall have better explor'd and settled; if that very learned man Francesco Serao shall be able, at any time, to complete what he has begun on the subject of this insect.

Yet in the mean while, as far as relates to the scorpions of our country, I am not quite free from doubt, whether many of those persons who have seem'd to suffer violent symptoms from being wounded thereby, were not rather affected by a fear which disturb'd the imagination: and not so much from the poison, (which was, perhaps, quite innocent) as from the agitation of the mind drawing the body violently into consent.

And this doubt, in which I also see that Maupertuis (*c*) is involv'd, may

(*t*) Comment. supra ad n. 25. cit.

(*u*) De Medic. l. 5. c. 27. n. 5.

(*v*) N. 24.

(*x*) Ibid.

(*y*) Dissert. de Tarant. c. 9. & Hist. 1.

(*z*) Ibid. c. 7. & Hist. 3.

(*a*) Ibid. c. 10.

(*b*) Ibid. c. 6.

(*c*) Comment. cit.

be in part prov'd by this circumstance ; that some of them, who have scarcely receiv'd any wound, immediately complain of those symptoms which have not happen'd so soon even in those that died from the same poison : and yet the same persons, by the application of an antidote, or of some of those things which the common-people and they make great account of ; or of that which any physician, in whom they put great confidence, has recommended as a very certain remedy ; immediately cry out that they feel no more disorder, and that they are quite restor'd.

For this certainly seems to be a cure of the mind, not of the body : and if this has happen'd to procure reputation to any antidote, you see how undeservedly it must have procur'd it ; and that more certain remedies ought to be sought after.

29. But the poison of the vipers among us is not, like that of the scorpions, frequently innocent : since a great number would certainly die of their bites, or would, at least, be very greatly affected thereby, if these animals were not much more rare than the scorpions ; and, by reason of their magnitude, could not be more easily observ'd and guarded against : I say, would be very greatly affected, as I do not know of any remedy being yet found out, on which the human species can or dare depend, in order to obviate, or overcome, those very violent symptoms which succeed to the bite of a viper.

It had been very greatly recommended to eat the heads, and other parts of the vipers, for this purpose. But in the experiments of Redi (*d*) and Francini (*e*), the proposal did not at all answer.

Since this, we have heard the fat of the vipers greatly cried up, and still more of common oil, when applied to the part that was bitten.

Although it scarcely seem'd credible, that through so narrow and pretty deep foramina by which the biting viper immits its poison, sufficient access should be given to oily liniments in particular ; yet I chose rather to leave the determination to time : which, as it has demonstrated the more certain and useful efficacy of new remedies, as of the Peruvian bark, has also demonstrated that of the transfusion of the blood to be doubtful and dangerous ; and, not to go too far from the matter now in question, as it has shewn so many other remedies, formerly recommended against the venomous wounds of animals, to be of no effect, and has buried them in great oblivion : so that, for the sake of example, which Abbatius (*f*) has said " was tried " and tried at Padua, and found to be very useful," I have never heard of as being barely mention'd ; much less as being made use of by any one ; for almost the fifty years that I have liv'd in this city.

Scarcely, therefore, had a few years pass'd, when those Memoirs of the Royal Academy of Sciences at Paris came forth (*g*), in which we have seen it demonstrated, by the experiments of those celebrated men Geoffroy and Hunauld, how slight and dubious are those boasted effects of the oily or unctuous applications : and that this judgment was *right*, even that very learned English physician Mead (*h*) has confirm'd.

(*d*) Lettera sopra alcune opposizioni, &c.

(*e*) Lettera del Platt fra le Opere del Redi
Tom. 2. dell' Ediz. Veneta.

(*f*) De admirab. Viperæ natura. c. 31. in
fin.

(*g*) A. 1737.

(*h*) Expos. Mechan. Venenar. Tent. 1.

And although this author has added, that a more probable praise might be ascrib'd to the viper's fat; yet he has ingenuously confess'd, that this method of cure is not to be depended upon: and this you will easily allow, from the example produc'd in the Memoirs I have mention'd, of a man who was bitten by a viper.

But he recommends, in preference to other remedies, that easy and expeditious one, which I meant to speak of above, when I denied that any remedy was yet found out whereto men dare trust; I mean, that suction of the poison which is immediately made with the mouth.

For although Celsus (*i*) has so confidently recommended this against the bites of all serpents, as to assert that, by this means, the person who sucks "would be safe, and would save the person whose wound he should suck;" and though this, which was commended even by Dioscorides (*k*), was in use, not only in the times of Galen (*l*), but also in those of Aetius (*m*), Paulus (*n*), and Actuarius (*o*), by whom it is prescrib'd; to omit Rhazes (*p*), and others; and, indeed, to descend to those who liv'd nearer to our own times, though it has been recommended by Tagaultius also (*q*), Vesalius (*r*), Abbatius (*s*), Severinus (*t*), Redi (*u*), and Charafius (*x*), and by others (*y*): I say, although it depends upon so many and so great authorities, yet we must not readily expect that the people can be induc'd to give credit to Celsus (*z*), or any-one else, when he says that this poison is injurious, "not by being tasted, but only in a wound:" not even if Severinus (*a*) should cry out never so long, "Let any one suck the poison out, and depend upon me, - - I pronounce, upon my word" and credit, and will be surety for the event, that whoever shall suck out "this poison, will be free from every taint and danger."

30. And, indeed, I should think that the people were very wise not to depend upon this surety, that there would be no danger in such an operation (*b*); notwithstanding the person who sucks should not attend to the monitum of Celsus (*c*), which is expressly confirm'd by most of the authors I have quoted: I mean, "That he has no ulcer in his gums, palate, or any other part of the mouth."

This monitum Redi made so much account of, and with great justice, that I remember to have heard, from some one of those who were then with him, that when one of them who drank the poison press'd out from the vipers, dipp'd a crust of bread into it at the same time, and ate it, Redi immediately blam'd him; lest the crust, by wounding the gums, as it often happens to do, should bring on instantaneous danger, instead of humouring the joke.

And the same author among other causes why a mountebank, who suck'd

(i) De Medic. 1. 5. c. 27. S. 3.
 (k) De Medic. Mat. 1. 6. c. 40.
 (l) Meth. medend. 1. 13. c. 6. ad fin.
 (m) Tetrabibl. 4. Serm. 1. c. 10.
 (n) De Re Med. 1. 5. c. 2.
 (o) De Meth. Med. 1. 6. c. 11.
 (p) 8. Almans. c. 1.
 (q) Instit. Chir. 1. 2. c. 11.
 (r) Chirurg. magn. 1. 3. c. 14.
 (s) L. cit. c. 31. & 32.

(t) Viperæ Pyth. P. 3. c. 5.
 (u) Offervaz. int. alle Vipere.
 (x) Vid. Sepulchr. S. hac 10. in Schol. ad Obf. 6.
 (y) Vid. du Hamel Reg. Sc. Acad. Hist. 1. 4. c. 6. in fin.
 (z) S. 3. cit.
 (a) C. 5. cit.
 (b) Ibid. & alibi.
 (c) S. 3. cit.

the wound of his arm which had been bitten by an asp, died; and even why two men who suck'd their fingers which were wounded by a viper, died nevertheless; as *Ælianus* (*d*), *Matthiolus* (*e*), and *Amatus Lusitanus* (*f*), have written; conjectur'd (*g*), that we ought to take for granted, that they happen'd to have their mouths injur'd by a kind of little ulcer.

Yet these, and other events to be taken notice of below (*h*), terrify men, while they are afraid lest that which has happen'd to any-one, whatever the cause of it might be, should happen to them in the same manner; especially those who have a scorbutic laxity of the gums, or any thing nearly of the kind: since *Matthiolus* (*i*) has observ'd, that, even without this, "blood easily flows from the gums by the force of strong suction."

They are also terrified by these other monita which most of these authors, who we have said approve suction, in concurrence with *Avicenna* (*k*), have inculcated: I mean, that the person who sucks it may not be fasting; that he must hold oil in his mouth after washing: and that he must immediately spit out what he has suck'd.

These warnings are so much the more terrifying, because the very learned *Mead* (*l*) himself commends almost the same things: although he says for this reason, "that the acrimony of the poison may not inflame the lips and the tongue" of the person that sucks it; nor without occasion: since he, upon tasting the poison of the viper, together with other persons, though mix'd with water, perceiv'd it to be "of an acrid and fiery taste, as if the tongue were perforated by any hot and burning body," this sensation lasting two or three hours: and, indeed, his companion, who would taste it undiluted, got a little ulcer thereby upon his tongue, together with some inflammation and tumour, which remain'd for the space of two days.

Men were far less terrified when they read either *Severinus* (*m*) asserting that this poison had a taste like "the unripe service-berry;" as *Branchinus*, a principal apothecary at Siena, perceiv'd, when, in the presence of *Severinus*, "he lick'd it with his tongue, and tasted it, without suffering any mischief therefrom:" or *Charasius* (*n*) affirming "that it had been tasted, and swallow'd; as he had often experienc'd; and that it had neither hurt any man nor any animal;" so that, as he at length adds, "he himself did not decline taking it into his own mouth, without any previous or consequent washing of his mouth:" or *Rhedi* (*o*), in particular, saying "he had seen in an infinite number of instances, that the lips of those who lick'd it, and swallow'd it, did not swell;" and speaking of his servant *Jacob*, who lick'd or drank it every-now-and-then with a kind of pleasure; as he certainly would not have done it on the following day, if he had receiv'd any injury in his mouth, or stomach, therefrom, or had perceiv'd an acrid and burning taste; which, on the contrary, *Redi* asserts to be "a sweet insipid" in that poison, "and very similar to the savour of oil of sweet almonds."

(*d*) *De Hist. Animal.* l. 9. c. 62.

(*e*) *Comment. in Dioscor.* l. 6. c. 40.

(*f*) *Cent.* 3. *Curat. Med.* 14.

(*g*) *Observ. cit.*

(*h*) *N.* 33.

(*i*) *Ad c.* 40. *cit.*

(*k*) *Canon.* l. 4. *F.* 6. *tr.* 3. c. 1.

(*l*) *Tent.* 1. *cit.*

(*m*) *Cit. P.* 2. c. 4. *ad fin.* & c. 8.

(*n*) *Vid. Sepulchr. in Schol. ad Append. cit. Obs.* 6.

(*o*) *Observ. cit.*

But in regard to so great a diffension among authors, it will be our place to speak of that presently again.

Now, then, judge whether, from this very diffension, courage can be given to the people to make use of suction: especially as they see that most authors, either among the ancients or moderns, who have recommended it, do not trust more to that alone, in general, than to the remedy which, as well as the suction of the mouth, is immediately at hand, and yet not unlike it; or, at least, is less liable to suspicions; I mean, that of cupping-glasses: for, after the use of either of these remedies, they order still other and other remedies; which is a very evident proof that suction, therefore, is not the remedy by which we may always depend upon the poison's being drawn out of the bottom of a very narrow wound; and even out of the windings and turnings of the adjacent cellular membranes, into which it may sometimes have insinuated itself.

And this you may suppose to be said of other methods of suction, either by siphons, or leaches, or by any other means whatever.

But as to the more efficacious chirurgical remedies; such as deep scarifications, burnings, or amputation; I have not spoken of them for this reason, that most persons who are bitten by a viper, either do not admit of these remedies while they promise themselves the same happy event which they hear many have receiv'd from a milder method of treatment, or, at length, cry out for the use of them too late: for that which Kramerus (*p*) asserts is very rare; I mean, that he knew a person who had his finger wounded by a viper, whereby his whole arm was inflam'd, and a fever and frequent swoonings had come on, together with deliria, spasms, and other symptoms of the like kind: and yet that this person, "at the end of two-and-thirty hours after receiving the wound, was cur'd perfectly by the amputation of the finger." You see, therefore, why I omitted these things, and consider'd only the milder methods; some of which I shall even take notice of below (*q*).

31. But how happen'd it, you will say, that so much reputation has been gain'd by suction, and many other of the milder kind of remedies, even in ancient times; unless men had been seen to be sav'd by them?

I, however; to omit this consideration, that it is very seldom any-one has escap'd without making use of many remedies, so that it was difficult to determine to which, in particular, he ow'd his safety; shall certainly think this worthy to be attended to, that many instances occur, among those who have frequently made the experiment, of beasts who have had their lives sav'd after the wound of a viper, without the application of any remedy either internally or externally; notwithstanding they have had violent symptoms therefrom: and, indeed, you will meet with instances where the bite had no bad effects at all; or, at least, only very slight symptoms. Thus you will read that it happen'd very frequently to Redi (*r*).

So there are other observations of the Parisians, as well those that Du

(*p*) *Commerc. Liter. A.* 1735. Hebd. 11.
n. 3. in 22.

(*q*) 31, 33.

(*r*) *Observ. de la Letteur de la ville d'Oppidum.*

Hamel (s) quoted formerly, as those that I have commended above (t), relative thereto. And if you enquire into the cause of these differences; I shall say that it might have been manifold, whether you consider the vipers that bite, or the animals that are bitten, or both of them.

Those circumstances that are common to both are age, constitution of body, strength, season of the year, food, and climate; from the variety of which there may be a various degree of the injury given or receiv'd.

Thus; to speak of different regions; you see which Severinus (u) excepts, as those whose vipers are not noxious by their bites; although what had been related to him of the English vipers (x) by Houghton, does not at all agree with those things that Mead (y) and others assert: especially where Mead affirms that the experiments of Redi had answer'd with him in England, as they had with Du Verney before in France; or where he affirms that the same disorders "are wont to arise, every-where, almost in a similar manner," from the bite of a viper: although, what is sufficient for our present design, he confesses that, according to the "difference of climates," and of the other circumstances nearly that I have mention'd, "these disorders may be heighten'd or diminish'd."

And you will easily conceive that one or the other of these two circumstances may happen, according to the different magnitude of the biting viper, his rage, and the acrimony of his poison; if you suppose that, from a larger and more enrag'd viper, a greater quantity of poison is inserted into the wound, and this wound is inflicted very deeply: for as to acrimony, the question is very clear; and that this is different in different vipers, is prov'd by the difference which we have spoken of above (z), amongst the authors I have refer'd to, in regard to the taste of the poison, and its effects upon the lips and the tongue: for no one would be so presumptuous, as to doubt whether those things, which are said to be observ'd by these authors, were really observ'd or not.

To these things we must add that which is the chief; I mean, that there is a great deal of difference betwixt the viper which has just bitten frequently and repeatedly, and that which has not done it yet after resting a considerable time.

For this was long ago recounted among the frauds of impostors, by the author of the book to Piso (a), *De Theriaca*, that the vipers "were made continually to bite" meat that was laid before them in private; for by these means "they must of course throw out the poison that was contain'd in their mouths;" from whence you, on the contrary, may deduce one cause why the hungry vipers wound more dangerously; and add it to the causes which others have suppos'd.

However, what that ancient author has asserted is confirm'd by Redi (b), where he says, he had many times experienc'd, that vipers throw out all their poison, if not at the first, at least at the second bite; so that the third

(s) Reg. Sc. Acad. Hist. l. 4. S. 1. c. 1. n. 6.

(t) N. 26.

(u) L. cit. P. 3. c. 1.

(x) Vid. & P. 1. c. 7. § 3.

(y) Tent. 1. cit.

(z) N. 30.

(a) C. 12.

(b) Observ. cit.

and fourth are afterwards quite free from poison: and although he hints below, that by the third also a poison may sometimes be communicated; and even, in another place (*c*), not only proposes an experiment, from whence the third, but also another, from whence the fourth appears to have been fatal; and the Parisians (*d*) one from whence the seventh appears to have been so; yet if you should choose to consider these things also, which happen very rarely; you see that it is not opposite to our purpose: for we must at length come to that bite which is not injurious, sooner or later, in proportion as the viper is larger or less; or at least as it has less or more poison collected; or as it more slowly repairs the loss of this humour; or more speedily; or pours it out more plentifully or sparingly at every bite; or, in fine, as it generates a less or more acrid poison; so that even the very last drop may be able to do what a larger drop is wont to effect.

32. To these circumstances add those that are peculiar to animals when bitten: such as the magnitude or smallness of their bodies; the hardness or tenderness of their skins; the inert or acrimonious state of their humours; the smaller or larger quantity of blood-vessels, or nerves, that go to make up the part bitten; and other circumstances of this kind. For the small animals, *ceteris paribus*, die sooner from the same quantity and acrimony of the poison; as reason evidently shows, and the experiments of Rêdi (*e*), and of the Parisians (*f*) confirm.

Wherefore, it is not to be wonder'd at, if we read in the first, that; when the same viper had bitten five ducks, and three pigeons immediately after, and neither of the three last ducks perish'd; the first of the pigeons died: or that, although birds very easily die from the bite of the viper, the horse, bull, and other larger animals, that have an exceedingly hard skin, very frequently do not die: for they must of course receive less deep wounds.

Nor should I be much surpriz'd, if the experiments that are transferr'd into the Sepulchretum (*g*), should answer in the same manner, when often repeated: so that it would be certain these animals die the soonest, who are supplied with the most acrid humours, and have the most vivid circulation; but those that are supplied with more watry and viscid humours, and have a slow circulation, more slowly; and indeed, that some cannot be kill'd at all by these means.

And certainly, as in one and the same species of animals, there may be a different constitution of the humours, and even of the solid parts: in which way I think we must understand what is prudently hinted by the Parisians; I mean, how far it is to be suppos'd, that some animals of the same species suffer more or less grievous effects from the viperine poison; so that although this be emitted in the same quantity, and the bites seem equal, they do not die equally, or not equally soon or late: since, I say, these things are supposable; it seems that we may gather from hence, why the animals of one species do not always die in the same order in which they were bitten by the

(*c*) Lett. cit.

(*d*) cit. supra.

(*e*) Lett. cit.

(*f*) cit. supra.

(*g*) in Addit. ad Sect. hanc 10. Schol. 2: ad Obf. 2.

viper; but sometimes, as of the five pigeons of Charafius (*b*), that first which receiv'd the fifth bite, and of the three chickens of the Parisians, that much the latest which receiv'd the second: although, as Charafius is entirely silent, whether all the pigeons were wounded in the same part of the body, or in a different part; and the Parisians had before said, that not all, but "almost all" the chickens, on whom they made the experiment, were bitten in the same part; other causes may be added, whereto we may attribute that change of order in dying.

For the bite being receiv'd in that part where there are a great number of blood-vessels, and those large; or where there are very few, and these small; or where there are many or few nerves in like manner; may be more pernicious, or more slight; so that, even by the very discharge of the blood, when it is quick and hasty, the poison may at the same time be thrown out, together with the blood; as has been observ'd by Redi (*i*): and whether this rejection might happen, in some measure, by the serum flowing out of the wound, you yourself will judge; for the Parisians deny their having seen so great a discharge in those animals which perish'd, as in those that were preserv'd.

33. You will, without doubt, here ask me, whether the poison of the viper, or its noxious quality, is carried into the internal parts of the body, by means of the veins, as most persons imagine; or by the nerves, as the celebrated Mead (*k*) supposes. You will perhaps be influenc'd to think with the first, by that experiment, besides others, which is propos'd in the Sepulchretum (*l*), as made "more than once" upon dogs; I mean, that by the poisonous juice extracted from the heads of vipers (which were wash'd with a little warm water, while they were press'd) and injected into the blood-vessels, they perish'd in a short time.

But when you observe that many other things which are by no means poisonous, when injected in the same manner, bring on death in a short time equally (*m*); you will more willingly consider the arguments which are produc'd by Mead for the way of the nerves. For he himself also, did not before disallow the way of the veins (*n*); especially where the question was of poisons being introduc'd by the wounds or bites of animals.

But he afterwards chang'd his opinion, and suppos'd, that, like poisons when taken in, those also that are infus'd by a wound, attack the nerves chiefly; as he had attended to the surprizing celerity wherewith the bite of a rattle-snake kills a dog, that is to say, "in less than a quarter of a minute."

And even when the common viper had bitten the finger of a man, and he, as is mention'd above (*o*), had immediately applied his mouth to the wound and suck'd out the blood; "he fell down dead suddenly the moment it was done:" or as the same Matthiolus, who saw it, says in another place (*p*),

(*b*) Sect. ead. Obs. 6. §. 8.

(*i*) Lett. cit.

(*k*) Tent. 1. cit.

(*l*) Schol. 2. supra cit.

(*m*) Vid. ex. gr. inter inject. Courtenii §. cit. supra ad n. 16.

(*n*) Vid. Introd. ad Tentam.

(*o*) n. 30.

(*p*) Comment. in Præf. Diosc. ad l. 6.

"fell suddenly down upon the ground, where being immediately depriv'd of speech, he died."

The effect was not fatal indeed, but very noxious and sudden, from the same cause, in a viper-catcher, whom Sommerus (*q*) cur'd. For he having suck'd with his own mouth, two little wounds which were inflicted upon his finger by a viper; "his tongue immediately became tumid, as if he held an apple in his mouth, together with an impediment of speech and deglutition, an obscurity of the sight, a tumour and heaviness of the head."

Nor would I have you immediately believe, because we have produc'd the conjecture of Redi (*r*), referring the cause of events of this kind to some little ulcer of the mouth; that the poison had enter'd into some veins which were open in the ulcer: for those who are of the opinion with Mead, might, on the other hand, say, that not only the little veins, but the small nerves also, lie open to the injuries of the poison in this ulcer.

And lest you should blame suction more than a bite; read, even in the Memoirs of the Parisians, what happen'd to that Englishman, who would have the experiment, of being bitten by a viper, made upon him. That is to say, from a bite upon his hand, a violent pain extended itself immediately through the whole remaining part of the upper limb, even before the viper had ceas'd to bite.

And you will be led to suppose, that the pain is to be imputed to the nerves, not as wounded, but as infected with poison, from that memorable circumstance taken notice of by Mead (*s*), "that the dog had bark'd but little, while a wound was inflicted" with a sharp needle, in a form similar to the tooth of a viper; but that when, by the same needle, "the poison was introduc'd, he then howl'd exceedingly."

But besides the very speedy progression, or at least sometimes, of this poison, or of its noxious effects; which cannot be accounted for from the slow motion of the blood through the veins; add thereto the experiments of the same celebrated man upon the human blood, when receiv'd in a glass vessel; as it was not at all chang'd, "either in colour, or consistence," by reason of having the poison of the viper join'd with it: so that neither at that time, nor afterwards, could it be distinguish'd from a like portion of the same blood, to which nothing had been added.

Nor would I have you be stagger'd by what you will read in the Sepulchretum (*t*), that, in animals kill'd by this poison, the blood was found to be coagulated; and even in the heart, and all the veins, "to be concreted into very tenacious polypi." From the same Sepulchretum you will meet with contrary observations (*u*), of the blood being found "more fluid than coagulated;" or "exceedingly thin and acrid;" or dissolv'd "in part, and corrupted;" and no-where "coagulated."

But if, nevertheless, you observe some observations amongst these, which mention coagula and concretions; read frequently the Parisians I have commended, who, although they relate that in England two pigeons had their

(*q*) Eph. N. C. Dec. 3. A. 3. Obs. 152.

(*r*) n. 30.

(*s*) Tent. 1. cit.

(*t*) in Addit. ad hanc 10. S. O
Schol. 2. ad Obs. 2.

(*u*) Obs. ead. 2. & Sect. ead. O

blood coagulated, yet at the same time assert, that in the same, and many other species of animals, no sign of coagulation, but, on the contrary, marks of fluidity, were found in the blood: and even Redi (x), who nevertheless had found a coagulation in some, expressly denies his having found it in all.

It therefore sufficiently appears, that it is not the *immediate* and proper effect of this poison to coagulate the blood; nor yet to dissolve it: but according to the various dispositions of this fluid, and according to the various affections of the nerves in particular, whereby, as is said above (y), the motion of the blood is surprizingly disturb'd, it is vitiated in a various manner; so that, as you will perceive by reading over again the greater part of the observations referr'd to, in some it is of a very lively and bright red, in others black, and prone to corruption.

And this being the state of the question, you readily see, of yourself, that whenever medicines which are fill'd with volatile particles, that have been long since recommended against the bites of vipers, have seem'd to be of advantage, they have either lit on those cases wherein the blood was inclin'd to concretion, or have rather been useful by helping the nerves.

And this there would be the more reason for saying, if that method which succeeded so happily in the botanical pupil of that celebrated man Jussieu (z); who had three fingers bitten by a viper, not without a numbness and insensibility of them almost immediately coming on, and a considerable tumour extended quite to the very hand; from a volatile alkaline remedy being given internally, and applied externally also, to the wound, join'd with the oil of amber; if this method, I say, when recurr'd to very early, as it is said to have answer'd in a great number of brute animals, should likewise be found hereafter to answer in the human species, or at least in the greatest part of that species.

24. Yet we are not, for that reason, to deny that the vitiated blood of those who are bitten by a viper, accelerates death: and we must even grant to the Parisians (a), that it contributes much thereto; especially as when it is infected by a gangrene, which is generally wont to seize the wounded part, and the parts nearest to it, it carries the same taint into the distant and internal parts; as was seen by them in the heart and liver of a goose; and had been sometimes seen by others in the liver, which was of a blackish colour inclining to yellow; at other times in the stomach, the colour of which was "in some measure obscure," not without "a kind of appearance of lividness," or "more obscure;" and in like manner in the mesentery and intestines, wherein that colour was "more manifest;" or, either those "that were painted here and there with livid spots," and at the entrance of the biliary ducts were "infected with a lividness, or rather with a gangrenous blackness," as you will find by reading over the observations pointed out above (b) in the Sepulchretum, and the scholium.

(x) Osservaz. cit.

(y) n. 9.

(z) Hist. de l'Acad. R. des Sc. A. 1747
Obf. Anat. 2.

(a) cit. supra n. 29. (b) n. 33.

Yet it sometimes happens, not only that these appearances are not remark'd, but even that no external lividness appears any where; as in the little dog of Francini (*c*), which had "no tumour or livid appearance in any part of the body:" and it is probable that from the small nervous branches themselves, that are there, being irritated by the envenom'd bite, contractions of the fibres are brought on, which cause the blood to stagnate in the neighbouring vessels; from whence arise the beginnings of tumour, inflammation, lividness, and gangrene: unless it should happen that there is such a disposition of the body, or of the wounded part, that, although in other places, as in that little dog, the nerves begin very soon to be convuls'd, yet the part which was bitten neither swells nor is livid; although it swells so very hastily at other times, that the Parisians have assert'd (*d*) the beginning of the tumour to be observ'd in the same moment that the bite is receiv'd: yet in that noble youth whose history you see describ'd by Charafius, in the Sepulchretum (*e*), it was not observ'd till "after some hours."

Nor does it seem that any other reason, besides the different disposition of bodies, can be assign'd why the tumour, in some persons, extends itself but little, and in others extends itself very considerably; so that in the very same noble youth, when the whole limb, which had been wounded, was occupied thereby, together with the neighbouring hypochondrium and breast, it seem'd to be now proceeding on to attack the opposite side also: and in another example propos'd by the Parisians, the tumour seiz'd on the hand opposite to that which was wounded still much sooner: and indeed our Fallopius (*f*), and Albertini (*g*), saw that the whole body was swollen from the bite of a viper; to omit Dioscorides (*b*), whose words I know are differently read by different persons (*i*).

Yet sometimes cases happen, in which, if you would wish to explain the effects of the bite of any venomous beast, it is not sufficient to speak of the peculiar disposition of body; as when a horse (*k*), whose right foot behind was said to have been bitten by a field-mouse, and which died in the space of two days, appear'd, upon dissection, to have not so much the cells of the adipose membrane, from the foot quite to the neck, fill'd with a yellow serum, and black here and there, as if from contusion, and the muscles flaccid; and these appearances on the right side; as to have the right lobe of the lungs distinguish'd with black spots, and the right auricle of the heart itself yellow and fill'd with serum; at the same time that the muscles on the left side, as well as the lungs, and the auricle, were perfectly sound: which difference you will not deduce from the virulence being carried into the blood from the wound, nor from a certain disposition of the blood; but rather from the nerves on the right side being irritated; especially if you have an eye to the state of the auricles.

(*c*) Lettera cit. n. 29.

(*d*) Ibid. cit.

(*e*) Append. ad Obs. 6. hujus 10. Sect.

(*f*) De Tumor. præt. nat. c. 3.

(*g*) Opusc. 2. in Comment. Inst. Sc. Bo-

non. Tom. 1.

(*b*) De Med. l. 6. c. 10.

(*i*) Severin. c. 1. cit. supra ad n. 31.

(*k*) Vid. Murry Quæst. Med. Paris. propos. dic ult. A. 1749. n. 4.

35. But that you may account for the varieties which are to be observ'd in the effects of the viperine poison, in other cases; as well as in those which I spoke of just now; from one or other of the causes that I mention'd lately, I will take notice to you here of some of the principal varieties.

A vomiting, if you attend to the greater part of the observations pointed out, you will scarcely ever suppose to be absent. And yet Paulus *(l)*; Aetius *(m)*, and Avicenna *(n)*, would not have spoken of it-as they have done, if they had not seen it wanting in many; for the two latter say that they have seen it "sometimes," and the former that it happen'd in "some persons."

Nor does Courtenius *(o)*, though he speaks of many dogs, and among other symptoms does not spare to mention a kind of lethargic stupor; which is otherwise not taken notice of by many; as the "usual" effect of this poison; give the least hint of a vomiting: nor is this done in the experiments of that second scholium; nor in those of that sixth observation, which we have referr'd to above, from the Sepulchretum *(p)*; if you except one however, the words immediately subjected to which expressly say, "no vomiting was the consequence."

In like manner in these experiments, and those of Courtenius, I do not see that intestinal discharges which were worthy of notice, are spoken of; and yet the violence of these discharges, or their peculiar nature, has been observ'd by many authors: and the celebrated Mead *(q)* has said, in respect to the dog which he had infected with this poison, by introducing the needle infected therewith: "the usual disturbances came on, vomitings, stools, &c." And certainly, in the third example of a man bitten by a viper, which is describ'd by the Parisians *(r)*, it is very evident how violent both of them were.

But in the two which precede that, stools are not so much as mention'd; nor yet formerly by Dioscorides *(s)*, Aetius *(t)*, Paulus *(u)*, or Avicenna *(x)*: the three first-mention'd of whom take notice of "tormina," Avicenna "a heaviness in the back," all of them "a difficulty of urine;" and indeed, instead of this, Aetius mentions "bloody urine," and almost all of them "bloody gums." Yet I do not remember to have read of these, and the difficulty of urine, in later observations.

Bloody urine, however, is taken notice of in both the dogs of Harderus *(y)*; and I know that the man, spoken of in that first example among the Parisians, complain'd of his back, and of tormina; and likewise that the young man of Charasius *(z)* complain'd of severe and continual pains about the navel: and in him also was a tumour of the lips, which Redi *(a)* says was mention'd by Avicenna.

If this author therefore, and those other ancient physicians, have not

(l) De Re Med. l. 5. c. 12.

(m) Tetrab. 4. S. 1. c. 21.

(n) Canon. l. 4. F. 6. tr. 3. c. 32.

(o) §. cit. supra ad n. 16.

(p) n. 33.

(q) Tent. 1. cit.

(r) cit. supra n. 29.

(s) *(t)* *(u)* *(x)* capitib. cit.

(y) Sepulchr. S. hac 10. in Additam. Obf. 2.

(z) supra n. 34.

(a) Osservaz. cit.

not omitted the less frequent symptoms; so much the more reasonable does it seem to suppose, that they would have spoken of intestinal discharges, if they were so frequently observ'd by them.

But I do not remember one author, either among the ancients or moderns, who has not seen convulsions, and has not spoken of them either under this very name, or under that of convulsive motions, tremors, tensions, or horrors; or at least who has not produc'd some symptom which could not be easily explain'd without them.

I omit other things which I am not at leisure to produce: I omit all the symptoms I have spoken of but vomiting; which I have said to have been so frequently observ'd; and which deserves so much the more attention here, as the Parisians, who have acknowledg'd it to come on "pretty constantly," have nevertheless denied that they had "generally" found any mark of inflammation in the stomach, and much less of gangrene: so that, in the great number of animals which they had dissected at least, it seems that it ought to be accounted for from the nerves being vellicated and convuls'd.

36. Nor indeed can we easily dissent from that very learned man, whom I have often commended, when he thinks that from thence we ought to deduce the reason why those who are bitten by a viper become icteric; for the mixture of a very little poison cannot so soon change the nature of the particles in the blood, nor the mode of their mixture, as it can, by convulsively constringing the beginnings of the biliary ducts in the liver, retain the particles of the bile which ought to be continually thrown off from the blood.

I also give credit to him in this respect, that the colour of the whole skin becomes "yellow" within less than a complete hour: yet I suppose this to be sometimes only; and not so often that we can pronounce an effect of that kind to be "proper to this poison."

And I remember indeed to have found Cardanus (*b*) wondering that "those who are bitten by vipers, very frequently contract such a colour in the twinkling of an eye."

But I have also read Donatus (*c*) since affirming, "that men seldom become jaundic'd" from a virulent wound; and, for that reason, supposing this to happen only to those persons whose blood abounds with a very great quantity of bile; which, if it be yellow, tinges the skin of a yellow colour; if black, of a black colour; and if porraceous, of a porraceous colour.

And that the skin was ting'd of this colour, and not very soon neither, is certain from the example of Galen (*d*), which he produces; and with a citron colour, from another example which he quotes from Avenzoar (*e*); and not from the bite of a viper, as in the former, but from taking poison into the stomach.

To this add, that a yellow jaundice has been observ'd to come on from the pricking of spiders, as you have it in Etmuller (*f*); yet not always, nor

(*b*) Comment. in Hippocr. Aph. 62. l. 4.

(*c*) De Med. Hist. Mirab. l. 1. c. 9.

(*d*) De Loc. aff. l. 5. c. non 6. sed 7.

(*e*) l. 1. tr. 13. c. 6.

(*f*) Prax. l. 1. S. 17. c. 3. art. 4.

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from the pricking of all spiders. For you may see, for instance, what considerable disorders that brought on of which Bernerus (*g*) speaks; and how different, and, frequently, how much more pernicious, those of which that learned man Brogiani (*h*) has written, under the name of the *Etruscum Phalangium*, or venomous spider of Tuscany, in a treatise which I could wish had been publish'd before I revis'd these letters that I had already written.

From them he also remark'd this, on account of which you may compare them with the venomous spider of La Puglia, and with that scorpion whereby I have said (*i*) that Peter a Castro had been wounded; I mean, that in the following year the symptoms return'd at the same time. Yet you will observe that, among so many different injuries, no writer makes mention of the jaundice.

Moreover, although Etmuller subjoins the following words, "That the ancients had already observ'd a jaundice, in general, to arise from the bite of the viper, as Zacutus Lusitanus, l. 5. Medic. Princ. Hist. 29. relates;" yet, if you examine this author, you will find that he relates nothing more on this head than Donatus, whom he follows more than any-one can suspect who does not compare them both together: yet he does not follow him well, where he describes the observation of Brasavolus (*k*) upon Tombesius; as if Donatus had produc'd this by way of an example which related to a jaundice brought on by the bite of a venomous animal.

Paulus, indeed (*l*), and Aetius (*m*), both of whom he quotes, have made mention of the jaundice from venomous bites: and, indeed, Aetius expressly says that it "is wont to happen" from thence. But both these authors speak of poisons in general: and not particularly of the viperine poison; and although the second mentions this for the sake of example, yet he asserts that the skin is from thence ting'd with a "porraceous" colour; and even when he has a peculiar treatise thereon (*n*) "with a leaden colour;" and Paulus (*o*), in general, supposes "a depravity of colour," which Avicenna (*p*) says is "inclin'd to greenness."

And that you may conceive the jaundice to be not always produc'd, and to be of different colours in different persons; I would have you observe that Dioscorides (*q*) had written, that "a whitish colour is brought on" thereby: and that the most ancient of all these authors, Nicander (*r*), has said,

*Nigricat ipsa cutis, plumbi modo fusca colore,
Cerulea interdum est, ærisve simillima flori.*

And to return to Zacutus; he has, in another place (*s*), an observation which relates very much to the present subject; an observation which I wonder is not transferr'd into the Sepulchretum, by reason of a gangrene found in

(*g*) Eph. N. C. Cent. 9. Obs. 49.

(*h*) De Venen. Animant. P. 1.

(*i*) Supra, n. 24.

(*k*) Comment. in cit. Aphor. 62.

(*l*) De Re Med. l. 3. c. 50.

(*m*) Tetrab. 3. S. 1. c. 17.

(*n*) Tetrab. 4. S. 1. c. 21.

(*o*) L. 5. c. 12.

(*p*) Cit. supra ad n. 35.

(*q*) Cit. supra ad n. 34.

(*r*) Apud Severin. Viper. Pyth. P. 3. c. 1.

(*s*) De Medic. Princ. Hist. l. 2. Hist. 115. Obs. 20.

the liver. That is to say, two reapers who were fast asleep, having been bitten by the same viper, and both being agitated by convulsions an hour after, one of them "fell into the most yellow jaundice after ten hours; and the "other," who could not be sav'd, "fell into the most black jaundice after "fourteen hours; so as to bear the resemblance of an Æthiopian."

But what varieties of the icteric colour later observators than Zacutus have remark'd, I cannot say; as, in the examples of the human species that are describ'd, perhaps, on account of the regions wherein they were being less hot, I do not remember any mention to be made of the jaundice: nor yet in the great number of brute animals, whose eyes, at least, while they were yet living, or membranes, here and there, when dissected after death, would have shown an unusual colour (especially a yellow one) even to the most curious examiners.

37. Thus you have a long discourse upon the viper, (though, perhaps, not without its use in your studies) from comparing, one with another, the writings which were in my hands, not only of the ancient, but also of the modern authors: so that I think you cannot retort upon me what was formerly retorted, in regard to the letters sent to Lancisi (1), upon the poison of the asp, by gentlemen very learned, and in other respects very humane towards me; I mean, "that it would, perhaps, have been better to have made use "of my own experiments, than of the authority of Aetius, and the rest of "the ancients, who frequently proceed too incautiously in these matters."

I have here, without doubt, made use of the experiments also of the most cautious moderns: and these I would likewise have made use of in that disputation, if any such had existed. For I had none of my own experiments to send you upon the viper, as I was always taken up with various and various other occupations; even when my time of life would have permitted me to make them; and as I was always averse to experiments so full of danger, which would either have been injurious to me, as they had been to others, who had been long exercis'd in them (2), or would, at least, have created irksomeness and detestation (3).

But supposing I had not been restrain'd by these considerations; I do not see how these very learned men could expect that I should have made experiments upon asps, who have never been in Africa, and still less in Ægypt. For Strabo (4) writes, "that the Ægyptian asp," of which our disputation chiefly was, "has something peculiar to itself, in preference to the asps "of other places." For as to asps being spoken of as having been found out of Africa, and even in Italy itself, both by ancient and not ancient authors; without doubt, these writers have been led by the opinions and expressions of the common-people.

For "what we commonly call asps have scarcely any resemblance to those" of

(1) In Append. ad Metallothecam Vatica.
nam Mercati.

(2) Vid. Gentili Annotaz. alla pag. 73.
v. 25. della Lett. Filof.

(*) Vid Redi Lett. int. alle Opposiz.

(4) De Situ Orb. l. 17.

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which we were speaking, as Salmasius (*z*) has justly imagin'd: and, certainly, neither Lucan (*a*) would have said of the asp,

*Ipsa caloris egens, gelidum non transit in orbem
Sponte sua, Niloque tenuis metitur arenas;*

nor would it have been thus spoken of by Ovid (*b*),

Plenaque somniferis serpens peregrina venenis;

if "these species of serpents" were not, to use the words of Celsus (*c*), really "not only foreign, but somewhat more pestiferous; and especially those that are generated in hot places."

Nor is this to be wonder'd at; since even within Italy itself the venomous wounds of some animals have different effects, in proportion as the places are more or less warm. Thus the tarantula, says Baglivi (*d*), "is only poisonous in La Puglia; and especially that which is found in the plains: for that which is found in the mountains round about, either has no poison at all, or not one which is hurtful:" and still less even those tarantulæ of the plains, when carried into the other regions of Italy; as even the history propos'd (*e*) confirms.

We, certainly, have not such a country as Lombardius (*f*) observes the Irish to have, when he from thence deduces the reason why he could never see any poisonous animals there; and why the different animals of this kind which he had brought from England, were seen, for the most part, to die inflated and convuls'd, almost as soon as ever they were let loose on Irish ground.

Yet if the same thing had happen'd to the asps when brought here from Africa, as happens to the tarantula when carried elsewhere from La Puglia, must not my experiments have of course fail'd me?

Since, therefore, there was no possibility of making experiments without being very doubtful; and since, if there had been, the business of writing immediately, in which I was, for more than one reason, necessarily employ'd, would not have given me time to make the experiments; what was there left for me to do, but to make use of the testimonies of those persons who had either themselves seen the effects of the bites of an asp, or had read the writings of those who had seen these effects?

38. And here you will, without doubt, enquire of me, in regard to the disputation which I had with that very eminent man Lancisi on the kind of death which Cleopatra suffer'd, what I really thought in my own mind; since it seems to have been undertaken by me, as frequently happens betwixt friends, for the sake of exercise and speculation: nor is any-thing publish'd by me by way of reply to his second answer.

I, however, in an affair which could not be certainly determin'd without

(*z*) Plinian Exercit. in Solin.

(*a*) Pharsal. l. 9.

(*b*) Metam. l. 9.

(*c*) De Medic. l. 5. c. 27. S. 10.

(*d*) Differt. de Tarant. c. 7.

(*e*) C. 11. Hist. 8.

(*f*) Eph. N. C. Dec. 3. A. 3. Obl. 79.

the testimonies of the ancients, having happen'd to observe these remarks, made by Lancisi in the *Vaticana Metallotheca* (g), upon the image of dying Cleopatra: "On her arm is seen the asp, by the bite of which it is the vulgar opinion that Cleopatra died; although others contend that she kill'd herself by a draught of poison:" and suspecting that some passage was extant, in an ancient author, to this effect, though unknown to me; I had a view to nothing else, in both the letters, but to get the knowledge of this passage, if there were such a one, from Lancisi.

With this intention I wrote once, and a second time, to him, such things as could be immediately advanc'd and affirm'd by me in favour of the more common opinion. And though I understood, from the first and second of his letters, that there was no passage of this kind; I readily, however, pursu'd his desire to make an end of the disputation; especially in a controversy which had begun and proceeded, on the one hand, with such a diffidence, and, on the other, with such politeness and condescension, as to obtain great praises from learned men (h): so that it is not to be doubted, but one of these gentlemen, by whom it is said to have been "very acrid," had nothing else in view but the ready, nervous, and full-strain'd arguments, that were made use of on both sides. For he is very favourable to both of us; and he ascribes so much merit to me, in consequence of a humanity which is equal to his doctrine and erudition, that I dar'd not even wish for such ascriptions. But I return back to my subject.

I, therefore, did not think proper to make any corrections, when, almost two years after, it happen'd that Lancisi was to add an appendix to the *Metallotheca*; and wrote to me, that it was the pleasure of our most holy master that this disputation, which he had been so condescending as to read, should be publish'd with it; and that his holiness desir'd he would signify this to me, if I should wish to make any alterations or corrections in my letters, as he had done in his. For I wrote back to him, that the command of our master must be obey'd; and that it would be the more readily perceiv'd by every-one, that these letters were not written by me with an intent to publish them, if they came out in the same extempore dress in which they were first penn'd.

Nor, indeed, were the things I might have added of any great moment; yet some things there were which I shall now point out to you: not, however, in order to renew the controversy after it has subsided, nor to set up the common opinion as a certain one; but only that you may not suppose there is nothing at all to be said in behalf of one or the other opinion. Some of these arguments are to be taken from historians, some from physicians, some from both, and some from still other authors.

Among the historians, Vellejus (i), Ælianus (k), and Florus (l), have asserted with common and full consent, and without any doubt, that Cleopatra kill'd herself by the bite of an asp. But Vellejus was addicted to the vice of flattery and adulation above what can be believ'd; and is not reckon'd

(g) Ad fin. Armar. 10.

(h) Giornale de' Letter. d'Ital. Tom. 33.
P. 2. Art. 8. in fin.

(i) Hist. Rom. l. 2. c. 87.

(k) De Hist. Animal. l. 9. c. 61.

(l) De Gest. Rom. l. 4. c. 11.

among the historians by Quintilian : Florus has suffer'd himself to be carried away by a childish desire of saying wonderful things, even at the expence of truth : and if to these accusations, taken from Sigonius, Lipsius, and Scaliger, you add another, taken from Verderius (*m*), against Ælianus ; this author, also, recedes from the truth, while he endeavours to seem a different person from Aristotle.

Yet it would have been much more easy to produce the praises of each historian from a much greater number of authors, than to have search'd out these accusations in some of them.

These praises, however, I omit ; since it is sufficient to observe, in respect to the accusations, that it was of no importance to Aristotle of what kind of death Cleopatra should die in future times : and there was nothing wonderful in this, that she who, after having made the experiment upon criminals, had found for a certainty, no poison to be more speedily and mildly fatal than that from the bite of an asp, should make use of the same to destroy herself : and, finally, there was no adulation in respect to Augustus, by saying that she died of this bite rather than by a draught of poison.

For as to Vellejus not being nam'd among the Latin historians by Quintilian (*n*) ; neither is Cæsar himself nam'd : I suppose, because he did not consider the writings of either of them, though commendable, in the light of regular history, of which the question was in that place ; since Cæsar had left his book in the form of memoirs, or commentaries ; and Vellejus, having promis'd a larger volume in more than one place (*o*), had touch'd, in general, only upon the principal heads of his narration.

39. But to these three historians are oppos'd an equal number who have not affirm'd the same thing ; as Suetonius (*p*), Plutarch (*q*), and Dio (*r*) : and it is even contended, that greater credit is to be given to the two last authors, by reason of their being Grecians ; and, therefore, accusom'd to enquire after the truth of history with greater diligence than the Latins : particularly in an affair which relates to the Grecian empire ; and as they are, if you attend to the places, more near to the spot ; and, if you attend to the proofs of facts, better furnish'd therewith.

I do not intend to mention that saying of Quintilian (*s*), “ There is generally a licence in the Grecian histories, similar to that of poets ;” and still less that of Juvenal (*t*),

Quicquid Grecia mendax audet in historia :

“ Whatever glaring falsity Greece dare assert in history.”

And, indeed, I readily confess that there were excellent historians among the Greeks, by the help of whom we may even learn the Roman affairs ; especially as to what relates to the public rites and ceremonies.

For these customs, and other things of this kind, (as I think I have read

(*m*) Censur. in Auſtor.

(*n*) Instit. Orator. l. 10.

(*o*) L. 2. c. 48. 96. 99. 103. 114. 119.

(*p*) De duodec. Cæsar. l. 2. c. 17..

(*q*) Græc. Rom. q. Ill. Vit. in Anton.

(*r*) Rom. Hist. l. 51.

(*s*) Instit. Orat. l. 2. c. 4.

(*t*) Juvenal. Sat. 10.

in a certain epistle of Grotius) foreigners remark and deliver down, more punctually than citizens; as the latter suppose that it was to no purpose to give an account of customs which were so well known to every-body.

But we also learn a great many circumstances in regard to the political transactions of the Romans, from those great historians among the Greeks; and in particular down to those times wherein the Latins, at length, began to write their own actions with a greater degree of elegance.

For even "from the beginning of the Roman state," as Cicero asserts (*u*), "quite down to the time of P. Mutius the *Pontifex Maximus*, all the public transactions of every year were wont to be committed to writing by that supreme officer of religion;" the manner of which annals, he says, "had been imitated by many, who left, without any ornaments, only the monuments of times, men, places, and affairs that had been transacted;" as the elder Cato, Pictor, and Piso: which, without doubt, was the reason why their writings did not come down to us, contrary to the fate of those writers who took upon them to speak of the Roman affairs, in more elegant and pompous language.

And I think I do no injustice to the merit of any-one, if, in regard to the mode of the action, which is chiefly in question here, and which increases the glory of neither party, I give more credit to one Latin author, in Roman history, than to two Grecians.

And to what purpose is it to shew, whether the war finish'd by Augustus, by the conquest of Antony and Cleopatra, so as to drive them to the necessity of killing themselves, relates to the Roman or to the Grecian history; since both of them were Roman generals, and the prize of war was the kingdom of Ægypt reduc'd into a Roman province?

Yet Cleopatra was a Grecian, and that was a Greek kingdom; as their empire and their language flourish'd at Alexandria. Let it be so; for who denies it? The ancient origin both of the queen and of the kingdom were from the Greeks.

But do you, therefore, suppose the Grecian laws, customs, and language, to have reign'd in that kingdom after almost three hundred years? or the Ægyptian? or some other? a kingdom, whose kings, as Plutarch (*x*) himself confesses, had, before, "even not learn'd the Ægyptian language, nor left the Macedonian;" and that part of the people which had been "anciently from the Greeks, and was not unmindful of the customs and manners common to the Greeks," had already "dwindled away" in the age of Polybius, as Strabo (*y*) asserts.

For as to what is said of Plutarch and Dio being nearer in respect of place, and better furnish'd with facts; it is so long a tract of land that disjoins Bœotia and Bythinia, of which countries they were, from Ægypt, that it may seem not to be a very much greater extent which is interpos'd betwixt Ægypt and Italy.

But, what is principally to be consider'd in historians, there was, certainly, a less interval of time betwixt the death of Cleopatra and the time of Vel-

(*u*) De Oratore, l. 2.

(*x*) In Antonia.

(*y*) De situ Orbis, l. 17.

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lejus, than that of Plutarch; and of Ælianus, than that of Dio. And can we suppose that Plutarch receiv'd the more certain proofs of facts from his grandfather, when relating what he had heard from Philotas, an intimate acquaintance of one of Anthony's cooks; or that Vellejus, who liv'd very near to that time, might have frequently heard, both in peace and war, (in the functions of which (z) he was very well vers'd, and, like his noble ancestors, had obtain'd illustrious posts and badges of glory) the relations of these facts from eminent men who had been with Augustus at Alexandria?

But if, as to this author, is objected his adulation towards Tiberius, who was then living, and not yet come to his worst, but had, as Tacitus (a) says, "a mixture of good and bad during the life of his mother;" with whose death Vellejus has made an end of this his history, sending it soon after to Vinicius, who was consul in the following year; so we should be inclin'd to accuse Dio and Plutarch; the censures of Vallesius, Rapin, Bodinus, Vossius, and Lipsius, which expressly charge the former with plagiarism, with deviation from truth, with hatred against the most virtuous characters, with frequent adulations, and with frequent blunders, would not be wanting; nor the censures of other authors to charge the latter with a great want of knowledge in the affairs of the Romans; and not only of the very ancient transactions, but of those that have happen'd in not very ancient times: examples of which kind; to omit what is said in Lambinus (b); Paulus Manutius (c) produces a great number of, even in regard to one fact: and wonders "that he should blunder so shamefully;" which he also says, in other places (d), had happen'd to the same author "frequently:" although Bodinus (e) denies this to be surprising "in a man who was a native of Greece, and confesses, in the life of Demosthenes (f), that he did not understand "the Latin language sufficiently well."

And of the same kind is that accusation mention'd by Rhodius (g), that Plutarch, "having made use of the Latin codexes, was very often deceiv'd "in the affairs of the Romans."

Nor are those mistakes unknown, which Robortellus, an author whom I have commended heretofore (h), had remark'd in the same author, even in regard to the names of the Romans: nor that which Lipsius (i) says, where he expressly denies, not only that Plutarch, but that the Grecian historians in general, are to be prefer'd to the Romans; especially in those things that relate to foreign nations; and contends that the former "had not only err'd "in regard to the facts themselves, but had shamefully blunder'd about "proper names in particular."

I, however, on account of the other very great merits of both these historians; I mean, of Dio, and Plutarch in particular; omit these objections the

(z) Vid. Voff. de 1^o ist. Lat. l. 1. c. 24. & Boecleri Indic. Vellejanum. in *Vellejus*, cui adde Velleji, l. 2. c. 124. in fin.

(a) Annal. l. 5. in fin.

(b) Adnot. 16. in Cicer. Orat. pro Dejot.

(c) Comment. in Epist. 1. l. 2. Cicer. ad Q. Fr.

(d) Epist. 5. l. ejusd.

(e) Meth. Hist. c. 4.

(f) In Proœm.

(g) Not. ad Scribon. Epist.

(h) Epist. ad Cel. Polen. de III. Consul. Frontin.

(i) Var. Lect. l. 3. c. 20.

more willingly, because neither of them, any more than Suetonius; who was himself likewise so much later than Vellejus; denies, finally, what this author has asserted in regard to the kind of death whereof Cleopatra died: and although they do not affirm it, yet they have many circumstances from which, join'd together with the diagnostic doctrine of physicians, to whom we pass on, we may defend the opinion of Vellejus.

40. For Dio (*k*) affirms, "that only small punctures were found in the "arm" of Cleopatra after death: "two" of which punctures Plutarch (*l*) also takes notice of. And the same author and Suetonius (*m*) assert, that "psylli were brought by Augustus, that they should suck out the poison." From whence, then, should they suck it, except from these envenom'd punctures? For how advantageous a remedy suction must have been, when applied thereto, is sufficiently demonstrated above (*n*), from the opinions both of ancient and modern physicians.

And that these very small punctures, and in number two, agree very well with those things that the same ancient physicians have deliver'd down, with universal consent, in regard to the bite of the asp, the second letter of mine demonstrates.

For they have been universally compar'd to little obscure wounds that are inflicted by "a needle;" and almost all of these authors have asserted that they were "without any swelling;" and some have not omitted to tell us that they were "two in number."

Nor would I have you despise their united testimonies, as if they had copied from one another; for they did not always write from the knowledge of other persons, but from their own likewise: and this you will readily learn from reading them attentively, or from Freind's History of Medicine, where he has treated of each of them: and those things that they have advanc'd from the knowledge of other persons are, generally; the consequences of observations of excellent physicians; which, if they had not preserv'd them to us, we should be intirely ignorant of.

Nor because Dioscorides; who, nevertheless, had himself also previously asserted (*o*) the same things that were written by all, or almost all, those other authors, as I just now said; either was not the person we have heard was the domestic of Cleopatra, or has not made any mention of her being kill'd by the bite of an asp; are we, therefore, not to believe what he had said of the very small puncture without any tumour, which is the consequence of this bite: although the passages wherein Cleopatra was mention'd may, perhaps, like so many other things which Maranta refers to (*p*), have been lost from the codex of Dioscorides by the depredations of time: nor are there still wanting some persons who give credit to Suidas (*q*), when he asserts, that this was the very Dioscorides who "liv'd in Cleopatra's palace under Anthony;" as we have, in my opinion, some circumstances whereby the arguments of those who think otherwise are call'd into question.

(*k*) L. 51. cit.

(*l*) Vit. Anton. cit.

(*m*) C. 17. cit.

(*n*) N. 29.

(*o*) De Medic. Mat. l. 6. c. 54.

(*p*) Meth. cognosc. Simplic. l. 2. c. ult.

(*q*) Historic. ad Vocem *Dioscorides*.

“ fibres, however, do by no means form a compleat membrane ; for when
 “ the bladder is extended, they are found to be very much drawn afunder
 “ from each other ;” yet he did not deny but the coat, which was not made
 complete by these fibres, was completed by the membrane that lies betwixt
 them.

And moreover, although he immediately added the following words :
 “ And hence it happens that the urine must, of course, flow out through the
 “ interstices of those fibres, at any time when the internal membrane is
 “ eroded, if the external membrane did not, by its density, resist this
 “ escape ;” I, however, do not think that we must, of course, understand
 them so as to suppose, that he did not hold these intervals to be fill’d by a
 thin membrane, at least, if not by a dense and firm one ; especially as he
 has asserted, “ that the bladder is nevertheless compos’d of three coats,
 “ the external of which is made up of the peritonæum, the middle is fleshy,
 “ and the inner coat a nervous one, being made up of white fibres very
 “ densely woven together.”

14. Yet there is no membrane, or coat, you will say, in those interstices.
 But tell me, I beg of you, do you think that, if there were none, this
 would not have been found out, and acknowledg’d, among the excellent
 anatomists of former days ? Eustachius was certainly very eminent and skil-
 ful among them ; if any other was ; and yet that he had observ’d these in-
 terstices, appears very evidently from that figure, such as it is, which you
 see exhibited under number seven, in his twelfth table.

Did he, therefore, think you, exclude this membrane we are speaking
 of, from among the number of coats of the bladder ? No truly, but has
 even asserted the very contrary, in the following words (r) : “ The proper
 “ coat of the bladder is double, and the external ” (which is what we are
 speaking of here) “ has very conspicuous, thick, and almost fleshy fibres,
 “ which are distributed so variously in every direction, that to those who
 “ look upon them, they seem to have the appearance of many coats.”

But you will perhaps say, he, like the rest of the ancients, did not dis-
 tinguish a cellular web from a membrane.

To this I will not reply, that the custom of these authors was to consider
 parts, rather as they are found, naturally, in the human body ; than to en-
 quire into what they may be resolv’d, when you drive in the air forcibly ; as
 Albrecht did ; or water, as others have done ; that is to say, they enquir’d
 of what structure they were from the hand of nature herself, and for what
 purpose they were form’d in the manner they naturally occur ; and not to
 what state they may be reduc’d by artifice.

It is sufficient for me to say, that Winslow ; the very eminent anatomist
 of these times (s) ; though he very well knew that the fleshy fibres of the
 bladder were connected to one another by a cellular texture ; and might
 therefore be separated from each other by the introduction of air artificially ;
 has nevertheless enumerated this muscular membrane, among the other
 coats of the bladder : being very well aware, that if, because membranes,
 and many other parts, can be resolv’d, by the same artifice, into a more or

(r) Traët. de Renibus. c. 19.

(s) Expos. Anat. tr. du bas Ventre n. 451.

less evident cellular texture, they ought to be call'd by a name very different from what they have been accusom'd to bear; a much greater confusion would be introduc'd into the anatomical schools thereby, than ever it could administer utility.

I confess that, if the question were now of imposing names upon parts, in the manner of the first fathers of this science, or of those who formerly encreas'd it, and further'd its progress; it is not to be doubted, but many better names, than the present, might be thought of; and such as would be better accommodated to the parts that bear them. But it is better, in my opinion, to teach the truth which has been since observ'd, and to retain the ancient and usual appellations.

Thus, I by no means omit to teach, on proper occasions, what membrane, of what a nature, and how variously divided at the lower part, is subjected to the venous orifices of the heart; but, although I very much approve of names lately impos'd thereon, by the most ingenious men, I nevertheless still go on to make use of the usual terms of *valvulæ tricuspidæ* and *mitrales*; and continue to say *right and left ventricle of the heart*, the more willingly, because some of them expressly allow, that when they had chosen rather to speak of these parts, under other new names, they were not understood, even by very learned auditors.

But as I hope that, if I am not prais'd for this my intention, I shall, at least, be pardon'd for it; so I also hope, that if I should still presume, as you have seen me do, to number the prostate in the class of glands, I shall be pardon'd in like manner; because every one knows, that not only other persons, but even those who had declar'd war against glands in general, have done it, and still do it.

For though they, without doubt, knew very well, that not all the parts of the prostate could be fit for the secretion and preservation of the humour peculiar thereto; yet they knew, at the same time, "that almost the whole prostate was made up" of the glandular tubuli of this body; to use the words of Santorini; who has not only describ'd that in the same chapter which I have quoted above (1), but has also describ'd the levator muscle of this gland, the ligament, and the capsula (u).

And in proportion as the tubuli are in greater number and thicker, so much the more does it appear, that the prostate ought to be retain'd among the number of the glands; and a certain opinion of mine is confirm'd, in regard to the cause why the extremities of the seminal vessels, and the thinner part of them, is carried through that gland; I mean, that while these tubuli are depleted by venery, the continual compression of those vessels may be, at the same time, remitted, and the included semen may be thrown out.

15. But to return to the diseases of the urinary parts; when I lately read those things which laid me under a necessity of interspersing these remarks, in behalf of myself and others, who think and speak in the same manner; I also lit on that passage where the symptoms of a certain ischuria are propos'd; and an ischuria which is said to be very frequent; being of a middle

(1) 10. § 22.

(u) § 5. 17. 20.

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nature betwixt the renal and the vesical : that is to say, having its seat in the ureters, which are dilated to an extrême degree by the urine, that cannot flow down into the bladder, by reason of their violent strangulation at the point of insertion.

And these are the symptoms which are produc'd : a dull pain join'd with the ischuria, and a certain sense of weight in the loins, nearer to the bladder than to the kidneys.

There are extant indeed, as you very well know, many examples of dilatation in the ureters ; from different causes which constrict them at their insertion, or even stop up their orifices.

But if these causes continue so long, that the urine must, of course, dilate them in an extreme manner ; it must happen, long before this be the case, that the urine which is continually secreted, will fill up the very small passages within the kidneys, in such a manner as to apply violence thereto ; and, by pressing upon them, prevent the secretion which is there made : and this in so speedy a manner, that there can scarcely be time to observe the signs of this ischuria media, disjoin'd from those of the renal ischuria, of this kind, which obscure them : or if we have opportunity of observing the signs of this ischuria media, either before or after ; certainly, if they will be nearer to the bladder than to the kidneys, they will, of course, be perceiv'd, not in the loins, which the kidneys themselves occupy, but below the loins.

Other things, however ; to say nothing of those, which are advanc'd from conjecture, not from observation ; I purposely omit ; that I may, rather, among many things which I ingenuously commend, praise one, from whence a certain new cause may be taken, and number'd among the causes, not only of an incontinence of urine, but of a vesical ischuria, as far as they relate to the sphincter.

You are not ignorant how many and various things have been hitherto said of the sphincter vesicæ, on account of which, and my own observations also ; that have been made some at one time, and some at another ; I have been under a necessity of thinking differently of it at different times.

But now, as I see propos'd, instead of the sphincter, those very fibres, which ; being situated at the orifice of the bladder, and having not a muscular, but a ligamentous nature, and keeping up a pressure round about by means of their own elasticity ; shut up the passage of the urine, till at length they yield to the stronger powers which expel that fluid ; and when these powers cease to act, immediately restore themselves by their own elastic force, and return to their former office ; the very simplicity of the thing recommends itself to me, and shews me how I may impute an incapacity of retaining the urine, to the distraction, erosion, or incision of these fibres.

Nor am I less pleas'd with the solution of a considerable difficulty, as it certainly is. For if there is no power of the will over the ligamentous parts, but over the muscular only ; how does it happen, you would naturally say, that men have it in their power, immediately to restrain the urine in the middle of its course ?

It is answer'd therefore, that it is possible to do this, not by reason of the contraction of those fibres, but by reason of the contraction of the levator ani

ani muscle; in that part of it which lies beneath the bulb of the urethra, betwixt that and the prostate, like a handle.

And this part of the muscle I would call by the name of *pseudo-sphincter vesicæ*; which name, however, supposes a sphincter, though there is, in fact, none at all.

But, in order that I might be understood, I made use of the same name that they, against whom I there disputed, had made use of: although, if I had happen'd to be desirous of imposing that name, instead of the ancient name; a custom which I have always been averse to; I do not see how it would follow, that a sphincter of the bladder is suppos'd, as it is sufficient that other true sphincters are not wanting in some parts; and as, by comparing with these one which is not true, any-one may call the latter a *pseudo-sphincter*.

You see that this part in particular, if it restrain the urine by the force of the will upon it, may, if it be at any-time seiz'd with a convulsion, bring on a vesical ischuria; and that with so much the more ease, as it has even often brought on that very ischuria, when contracted, for a long time together, in order to retain the urine in obedience to the will; whether alone, or in conjunction with other muscles, which the celebrated Gysbert Beudt (*) suppos'd should be number'd, at that time, with the same levatores ani; or those which others have suppos'd, and particularly the celebrated Winslow, in the latter part of his never-to-be-sufficiently commended *Exposition*, where, in describing those that are to be added to his treatise on the belly (y), he has taught us, that by these is form'd, in part, and perhaps "principally," that muscle which is call'd the sphincter vesicæ.

For although, in those things which have been lately advanc'd, I commend the simplicity; yet, at present, I leave the matter to your determination, in consequence of preserving my usual custom, and considering it as certain, that if any-thing has been ascrib'd to me, (who am in other respects undeserving) by the candour and humanity of the most eminent men, they have done this, not because I determin'd any thing hastily, but because I made haste slowly; if I may be allow'd the expression; and even, where I thought it necessary to pause and take time, there paus'd and waited, till sufficiently repeated observations, and the never-to-be-omitted-reading of those authors, who might perhaps have seen, and written upon, the same thing on which I was in doubt, have taught me that there was no longer any necessity for pausing.

And both of these things I will certainly do now, if ever I did in my life.

For before I adjoin that uvula, which was just now spoken of, to the other parts which naturally exist in the body, I will read what others have thought of it in the mean while; I mean those to whom we can, with propriety, deny none of the great number of assistances, which are requir'd, if we speak ingenuously, in a great anatomist: and I will, at the same time, of how little importance soever I may be, add other enquiries to those which I have related.

(*) Dissert. de Fabrica & Usu Viscer. Uropoieticor. Class. 3.

(y) N. 660. & seq.

And the success of these investigations I will make known to you, after the dissections of the following winter are finish'd (z).

16. But I will write to you the other things which relate to the diseases of the genital parts, as soon as ever I am able; according to the promise I made you in the beginning of this letter. Farewel.

LETTER the SIXTY-SEVENTH

Relates to the Disorders of the Genital Parts of both Sexes, but particularly to those of the Female Sex.

1. **W**HAT still remains to be written upon the disorders of the belly, relates to the genital parts of both sexes. But the greater part will turn upon those of women.

2. After I had written to you (a) upon herniæ which happen in the scrotum, came out a dissection perform'd by the celebrated Richerzcius (b), in reading which, you will perceive, that it is not only of itself accurate, but useful in respect to the chirurgical cure.

In the same author (c), you will also see a peculiar hernia, either produc'd after birth, or, which is most probable, congenial; that is to say, in a girl six months old, whose left ovary, and adjoining tube, he found within that sinus, through which the round ligament of the uterus goes out of the pelvis.

But this is to be referr'd to the class of bubonocèles. Of which, and of ventral herniæ, if I were to discourse at present; I should take notice of two, amongst others, that are worthy of being remember'd; on account of what was contain'd in the dilated intestines; and that are propos'd in the History of the Royal Academy of Sciences at Paris (d).

3. But to those things which we have written upon the descent, and excision, of the uterus (e), relates the observation of Schlenckerus (f), of a descent thereof, in consequence of the ligaments being relax'd, by the weight of the impending ovary; which had become enlarg'd and stony.

Thus Abraham Vater (g) had seen the same thing happen to another wo-

(z) Vid. Epist. totam 70.

(a) Epist. 43. & alibi.

(b) Observ. Viscer. Abdom. labis Epicrif.

Obf. 1. (c) Obf. 3.

(d) In Obf. Anat. A. 1752. n. 5. & A. 1723

n. 7.

(e) Epist. 45.

(f) De Singulari Ovar. Morb. in Proœmio, & § 19.

(g) Differt. inscripta Gravidit. Appar. in Hist. & Thef. 18.

man, from the oppressive tumour of a large ovary. And as, from these observations, it is confirm'd, by dissection, that the uterus itself descends within the vagina; and it is shewn what causes, sometimes, produce this descent; so from the observation of the celebrated Kalt Schmied (*b*); whether he cut out a large schirrhous from the uterus, or a schirrhous mola, which, without doubt, coher'd with the uterus in such a manner, that it was necessary to cut it out with a knife; the suspicion may certainly be encreas'd of the deception of those persons, who have believ'd, in times of less light and knowledge than the present, that the uterus had been amputated by them.

4. And although, where I was speaking of the hysterical affection (*i*), I expressly profess'd, that I would not enter into any altercation with those persons, who contend that this ought to be distinguish'd from the hypochondriac disorder; nor, on the other hand, with those who deny it; yet you will remember that, in general, I commended those who refer both of these disorders to the passion of the nerves.

And in this opinion I have been still more and more confirm'd, very lately, by the authority of that very excellent, and, in respect of me, very humane man, count Sylvester Ponticelli, very deservedly Archiater and counsellor at the court of Parma (*k*); as I had also been confirm'd therein by other observations of other authors; and among these by two of that learned man Anthony Fracassini (*l*): and, in particular, by the second, which is join'd with the dissection of the body. And when you read what circumstances happen'd in those two men that are describ'd; of what nature these circumstances were; and in what manner they happen'd; you will readily conjecture why I made this assertion.

5. Now let us go on to subjects on which we shall dwell somewhat longer; I mean, to those which relate to the impediments to venery, and sterility. As, when I was speaking of these things in males, we consider'd a disorder of the urethra, when it is not in the form of a canal, but of half a canal only, carried over the inferior surface of the penis; we also made mention of the observation of Salzmann (*m*), of the urethra being open'd in the manner of a semi-canal, but on the opposite surface; that is, through the whole dorsum penis.

As this feat of the urethra, although not open, Ruysch saw, not twice as he says, but once only, if you consider the matter attentively (*n*), and confesses "that he had never observ'd it before;" I do not doubt but it will be doing a thing agreeable to you, if I communicate another example, which was related to me by John Gianella, son of Charles, formerly the professor here; who himself examin'd the case accurately, and is to be depended upon, in his narration; as well on account of his ingenuity and skill, as his diligence, and uprightness of manners: having been formerly my au-

(*b*) De Mola scirrhosa in utero inverso extirpata.

(*i*) Epist. 45. n. 17.

(*k*) Tratt. di tre Specie di Affez. Ister. e Ipochondr.

(*l*) Naturæ Morbi Hypochondr. &c. Investigat. P. 3. c. 1.

(*m*) Epist. 46. n. 8.

(*n*) Thes. Anat. 3. n. 5. not. 1, & 2. & n. 22. not. 1, 2, 3.

ditor, and very much esteem'd by me; and being at present settled in the practice of physic at Stalimene with considerable reputation.

6. There was a man in the country of Stalimene, who, although he was said to be an hermaphrodite, was nevertheless call'd before a magistrate, by a woman who asserted that she was with child by him, and without defending himself settled money upon her.

This man, being afterwards about to seek himself a wife, and being represented by the brother, and others, as not being at all fit for matrimony; and the physicians of the neighbouring city; who were men of eminence, and had inspected his genitals; having confirm'd this representation; incens'd with the shame of his repulse, and having enter'd into a law-suit with the brother, fell into so violent a disease, from these several vexations, that he soon ceas'd to live.

Leave being given to inspect, but not to dissect, the body, the scrotum and the testes appear'd quite in a natural state as to their situation, their magnitude, and form.

But in the penis, which, in other respects, was not small, nor seem'd to have been flaccid in the living body, were these unusual appearances observ'd: it was turn'd upwards towards the abdomen, and the glans, which was of its usual figure and magnitude, was entirely unimperforated; and, finally, the urethra was unusually short, and had a peculiar situation and structure.

For it did not reach quite to the glans, nor did it lie on the inferior surface of the penis; but upon the dorsum penis: nor was it a perfect canal, but was open in the manner of a semi-canal; so that the mouths of my canaliculi, which could not be in the opposite paries, as they are wont to be, immediately became obvious to the eyes in that which was not wanting; in consequence of their being larger than they are in other persons: and upon inspecting these parts, it was less to be wonder'd at, that the man should have been formerly infected with a virulent gonorrhœa, as they said he had been.

Moreover, in the beginning of that semi-canal, which was wider in the other part of it, a kind of vulva, as it might formerly have seem'd to the mother, and other good women, hung over.

But no foramen belong'd to this, except that it carried the urine into the beginning of the semi-canal; which it was very certain, from other testimonies, had been wont to flow out from the semi-canal, at the time of discharging it, and to have some part of it sprinkled upon the man: but we had no information of what happen'd to the ejaculated semen, in like manner, which was under a necessity of passing through that same foramen, into the semi canal.

And, indeed, you might introduce a probe into the foramen, and pass it on to some cavity or other, which it was natural enough to conjecture belong'd to the bladder; but to examine into the grounds of our conjectures, and other circumstances, by dissection, we were nor, as I have already said, permitted.

7. Gianella not only related what he himself had been able to see, in this man, without dissection; but he also told me of a situation of the pudendum in a certain woman, which is still more surprising: he himself, however, had only seen the representation of it, but he had heard it for a certain and attested

testified fact, from the inhabitants of Stalimene; and this was the tenor of his narration.

About forty years ago, there was a maid-servant in the house of the Venetian nobleman who was governor of Stalimene, that was married to one of her fellow-servants; but she had that part which we have mention'd above, not in the place where it ought naturally to be, but above the navel, and there very narrow.

Being impregnated, however, but not able to bring forth; she sent for a surgeon, to enlarge the passage for the infant, who endeavour'd to extricate himself from his confinement, in vain: and this the surgeon did in such a manner, that the section being produc'd from the lower part of that aperture, quite to the os pubis; whether it was entirely from want of skill, as was there suppos'd, or rather because he intended to make use of the Cæsarean section, as it is call'd, which was not sufficiently well known to him: it is certain, however, that the infant was sav'd, and the mother at length perfectly cur'd also, after a long course of attendance.

But what happen'd to her afterwards, is not known at Stalimene; because she went away from thence, together with her husband, as neither of them were natives of the place: but it is sufficient for our present purpose, that the figure still remains there, which was left by the physician of the woman, and which faithfully represents her abdomen, as it had been before the section was made.

8. Now since I have begun to speak of women that are unfit for matrimony; I will immediately subjoin what I have observ'd in the dissection of two of them, not in regard to the situation indeed, but in regard to the occlusion of the genitals.

9. A woman, of seventy years of age, had already lain a long time in the hospital, on account of an asthmatical disorder; when a peripneumony came on, and carried her off: this happen'd about the middle of March, in the year 1752.

From the carcase, which was emaciated, the lungs were extracted by our Mediavia; and these he affirm'd to be actually hard.

But I myself afterwards demonstrated some parts, to the students, from this body; and particularly in the head and the genitals. And in the head indeed, I found nothing that was preternatural; except a coalition of the tendon of the trochlearis muscle of one of the eyes, with its trochlea: so that the muscle did not follow the fingers of the person who drew it back.

But in the parts which were created for the offices of generation, I found a much greater number of appearances, quite different from the natural state, than I could have wish'd. For, in the first place, one of the Falloppian tubes had coalesc'd with the testes; by means of its fimbriated extremity; in such a manner, that the orifice, which lies betwixt the fimbriæ, did not appear: and the other had that orifice in an impervious state, and its most neighbouring part immoveable, by reason of the ala vespertilionum, which; not being pretty wide there, as it generally is, but very narrow; connected the tube to the testis.

The parietes of the uterus were thick: and the section thereof shew'd a sanguiferous vessel, or if you please a sinus rather, comprehended within their substance,

substance, for the length of a full inch, and of a diameter equal to a line and a half of the inch of Bologna. And in this sinus we saw a little coagulated blood.

The internal surface of the uterus was, in the whole of it, very slightly moist: in the fundus, and in the lower part of its neck, it was brown: and in the other part of a white colour: and why I mention these circumstances here you will see below. The same lower part of the cervix was narrower than it ought to be; and the osculum uteri very small.

When I attempted to pass a probe down through this orifice, into the vagina; I felt an obstacle in the way, which prevented it from going down below the orifice, except in the extreme part of it. I was therefore oblig'd to introduce the probe through the orifice of the vagina.

But as it was not possible to pass it up above the length of a small inch; I cut into the vagina deeply, in a longitudinal direction; that if there were any cavity it might come into sight. As I search'd in vain for any such appearance by these means; I then cut into the vagina transversely in more than one way: but no where did it appear hollow, nor did even any traces of a cavity appear.

The whole of the vagina; if you except the beginning and the end; was perfectly like a solid cylinder: being made up of a substance which was every where white, and hard in some degree: so that it was not possible to distinguish the parietes from that substance which was included therein; they being continu'd into each other, and perfectly similar.

Although this was the state of the vagina, it seem'd, nevertheless, to have lost nothing of its diameter, when look'd upon externally; but it had lost so much of its length, that although, from the orifice thereof to the upper part of the uterus, there was an interval of eight fingers breadths; the vagina was equal only to three, and the five others belong'd to the uterus: yet with this variation, that the cervix was longer than the fundus, contrary to what is generally the case.

But the cervix had no fasciculi, nor lines, protuberating internally. And it was in vain that, in this part, or in the fundus, or in the extremities of the vagina where it was not stopp'd up, any traces of cicatrices were carefully look'd for by me: nor were they to be found in any other part of the genitals. The inferior part of the vagina was without any traces of the hymen.

10. However, I believe this very considerable coalition of the vagina to have taken its rise from erosion; or from some laceration, which had not been attended to at all in a curative method, or at least only with great negligence: and we may suppose that this was a consequence of her last child-bearing; for the woman had been married, and had not lost her husband many years before, with whom she could not have liv'd in matrimony, nay could not have barely liv'd, if she had been in this state of occlusion from the original formation.

For how do you think that the menstruous blood, which we have no reason to suppose did not flow from a uterus of that kind, in a flourishing time of life, could be retain'd within the cavity thereof, without the destruction of the woman? I, at least, could hardly conceive, that it would happen otherwise in regard to the fluid wherewith the uterus is internally moisten'd in a
natural

natural state; as I have also said that I saw it to be in this woman; if it were not carried back by the lymphæducts, or other absorbent vessels.

But can you imagine, that these vessels are equal to the task of carrying back the blood also, and in that quantity wherein we know that it flows into the cavity of the uterus every month? And nearly the same question that I ask you in regard to this woman, I ask you of another also, whose body had been dissected in the college but two months before, and had afforded the following occasions of remark.

11. An old woman had died, in the hospital, of no other disorder, to all outward appearance, but of a decay of natural strength: nor was this to be wonder'd at in a person who was more than fourscore-and twelve years of age.

The body was very lank and contracted. From the abdomen two herniæ were prominent; the one in the middle of the hypogastrium, which was equal in size to the head of a child, and the other at the right side of the former. In both of these herniæ was a part of the intestinum ileum; but in the lesser was a part of the omentum also: which, except that they adher'd to the hernial sacs, had no mark of disease beside.

The stomach seem'd to be lower than it naturally is; which it might be, either because it had been drawn downwards, by that part of the omentum which was included in the herniæ, as we have said; or rather from other causes, and amongst these from a certain gland, as it seem'd at first to be, which was form'd in the omentum, near to the spleen, and was of the size and shape of a very large pigeon's egg.

When I inspected this gland a little more attentively, I suspected it to be another spleen; and this suspicion was very clearly confirm'd by dissecting, and comparing it with the neighbouring spleen: for the structure and substance of the two were exactly the same.

To the lesser spleen went some pretty thick sanguiferous vessels that belong'd to the omentum. The artery of the larger spleen was large; but tortuous in the slightest degree only: nor had it any thing hard in such an advanced age; nor had any other of all the arteries I examin'd, any thing bony in them; if you except the iliacs; nor yet any of the valves of the heart, notwithstanding those that lie at the beginning of the aorta, were very much contracted, and in some measure diseas'd.

Yet the whole portion of that trunk, which lies in the belly, was dispos'd to ossification; as it was of a surface almost every where distinguish'd with white spots, and with certain inequalities, and that internally. And the same trunk had this unusual appearance besides, that immediately below the emulgents, it was inflected to the extent of two or three inches: which inflexion could not be imputed to the vertebræ, as these I saw to be in a proper situation, and in a natural state.

But to return to the viscera; the glands of the mesentery were neither small, nor hard, nor yet of a black colour, or at least externally, but rather somewhat red: the appendicula vermiformis was shorter than usual by the extent of two inches, very slender, and intirely solid; so that it seem'd never to have had any cavity: and you would certainly have been in doubt whether the liver had always been sound.

For the right lobe ; in that part where it was now very near to the left, and from whence it continu'd to extend itself downwards, contrary to custom ; shew'd the convex surface to be not smooth, and of a white colour : and, if you cut into this part to some considerable depth, you found the same colour ; and the substance thereof approach'd to the nature of a ligament.

It now remains to speak of the genitals, as I have promis'd you to do. Both of the tubes were so grown into one substance with their ovaries, that the fimbriæ of neither of them, and still less the orifice which lies betwixt those fimbriæ, appear'd. And within the ovaria were hydatids.

The fundus uteri being cut open ; in the middle of its posterior surface was seen a pretty high and somewhat round excrescence, which at first seem'd to be made up of vesicles as it were ; but when cut into was found to consist of the solid substance of the uterus.

As I attempted to pass a probe from the fundus into the vagina, but was not able ; I cut open the cervix, and found that the parietes of the lower part of it had coalesc'd together, for a very short space ; and even that the parietes of the osculum uteri itself had suffer'd a coalition, in such a manner, that no passage remain'd ; unless perhaps the most streight and confin'd.

22. That these coalitions might be brought on by some laceration left after a difficult birth, as I have said (*o*), is perhaps confirm'd from hence ; that, in both the women, there was found to be an occlusion of the tubes, and a concretion thereof with the ovaries.

For Abraham Cyprianus (*p*) observ'd the tubes to have been in the same state ; as he also shows by the representation which he has added (*q*) ; in a woman, who, from the difficulty of her fourth child-bearing, and still more from the most violent dragging of an unskilful midwife, having been thrown into a very violent inflammation of the uterus, and of the parts annex'd thereto ; as was shown by the very severe pains of her belly, and particularly by the pains about the loins ; and at length escap'd from thence with difficulty ; instead of being a child-bearing woman, became barren ; and continu'd so as long as she liv'd, and she liv'd ten years.

But these things happen to women ; and I wish I could say to a few only ; from the same or some other similar cause ; and make those barren, who had, of themselves, been fertile, and would continue to be so.

Yet it is certain that some have occlusions, or obstructions, of the passages necessary for generation ; even from their original conformation ; and not only of the hidden parts, but of those, likewise, which are obvious to the sight or to the touch ; as I have taken notice on a former occasion (*r*).

And you will have a double example of this kind also from Boehmerus (*s*) : Who not only dissected a virgin, that was entirely without any perforation in the natural parts ; at the same time that no traces of a cicatrix appear'd ; but also inspected the body of a woman, with whom her husband had never been able to perform the conjugal duties, and found the orifice of the genital open indeed ; but in the place of one vagina, found two, leading to a bipar-

(*o*) n. 10.

(*p*) Epist. ad Millington.

(*q*) Tab. 2.

(*r*) Epist. 46. n. 11. & seqq.

(*s*) Vid. Act. Erud. Lips. A. 1758. M. Januar.

tite uterus; as in cows and sheep; and these, as far as we can suppose, so narrow that neither of them was capable of receiving a man.

But of these occlusions, or impediments; which are not occult, but obvious, either to the sight or to the touch; there are some that may be remov'd, and some that can not.

For those can easily be remov'd, that consist in the membrane which is stretch'd over the orifice of the vagina; or in bands, or fillets as it were, of the same kind; by one of which I found the parietes of the vagina tied together in a young virgin, as I have related to you (*t*). But those that are of the same kind with the impediments just now refer'd to, by me, from Boechmerus, and found in that married woman, who can remove?

13. And that the cause of an accidental coalition, or occlusion, may not only be from laceration, or from inflammation, but from erosion also, has been acknowledg'd by me, both above and elsewhere; whether such an erosion be the consequence of the lues venerea, or of an uterine fluor:

For from the latter of these disorders having preceded, even in the most pure and untouch'd virgins; such as she was whose dissection I have given you the relation of, in the forty-sixth letter (*u*); I believe we may, if we choose it, account for, with some pretence to plausibility, that whitish little membrane, which shut up the lower part of the cervix, near to the osculum uteri.

But this fluor must have been of the more acrid kind; and not of that more frequent species, whereof I have sent you many of my observations, in the forty-seventh letter. To these you may add that which I now subjoin; although, by reason of other things, of greater moment, which it contains, I should rather have sent it to you at the time in which I wrote the sixtieth, sixty-second, and sixty-third letters, if I had made it before that time.

14. A woman, about sixty years of age, had been carried off by an apoplexy, within four days and no more. Three of these days were pass'd at her own home: but on the fourth she was at length brought into the hospital; at which time she was so oppress'd by her disease, in the whole of her body, that we had no mark whereby to judge of a very violent paralysis being in the left side, but the venæsection which had been perform'd at home on the right side.

I was at this time teaching anatomy in the college; it being that very cold season, which began before the latter end of January, in the year 1758, and continu'd to be very troublesome to every one: and this body was brought to the college, where the greater number of its parts were dissected, but particularly the brain; and this about the eighth day after death, when that celebrated man Caldani; who, in consequence of his great partiality to me, would come hither from Bologna, to attend all the public exercitations of that year; was present.

The scull adher'd so closely to the dura mater, that it could not be pull'd away without the most strong exertions. The vessels that ran through the pia mater were distended with blood. The substance of the cerebrum was without moisture, and hard; I suppose, from the violence of the extreme cold, where-

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by the bloody serum, which we found, in great quantity, in the left lateral ventricle, had been frozen, and concreted into a great number of lamellæ.

Moreover, although in the posterior extremity of the same ventricle, there was a little black, coagulated, and pretty hard blood; and the basis of the ventricle seem'd there to have subsided into a kind of a cavity, which contain'd that blood; yet since so great a quantity of serum, as that I have mention'd, could not have come from so small a quantity of blood; I conjectur'd that both this blood, and the greatest part of that serum, had pass'd through a rupture of the septum lucidum, from the right ventricle into the left.

Nor was I deceiv'd in my conjecture. For, upon opening the right ventricle, there was no serum to be seen; unless that there might be a little perhaps in the anterior extremity: but there was so great a quantity of blood, of the same kind with that describ'd in the left ventricle; being black, and coagulated, and even having got that degree of hardness which is naturally brought on by freezing; that we saw the whole of this ventricle to be very much dilated: the substance of the cerebrum being very greatly extenuated, not only at the basis, but also in the external side.

Yet no disease appear'd in the cerebellum; none on the external surface of the medulla oblongata. But what disease there was on the internal surface of the basis of the ventricles; especially of the right; how great this was, or of what nature, and in what parts thereof it chiefly was; I could not very well discern: and that on account of the great effusion of blood, as well as from the effects of the frost in particular.

The thorax, which had been open'd before, shew'd two foramina in the diaphragm, as I had before seen, instead of one through which the vena cava is carried. And in the heart, which was fat; as the rest of the body also was in a considerable degree; I observ'd little bony scales about the subjoined valves of the aorta, and on the neighbouring internal surface of the same artery: and not there only, but up and down in the remaining trunk likewise; and even in the part where the curvature of this vessel terminated; which part, as well as the curvature itself, was dilated; was seen moreover a kind of inequality of surface, and a colour different from the natural colour.

But in dissecting the belly, and examining its parts, we met both with bony lamellæ, and with greater inequalities of surface: and indeed here and there were appearances of bloody erosions; all which appearances we also saw to be propagated through the iliac arteries.

The crural arteries likewise, where they descended through the thighs, were very rigid; and, in the hollow of the ham, as I at least observ'd on one side, bony.

And certainly little bony scales were not wanting in one of the carotids: and in the spermatics themselves was a hardness, which shew'd ossification to have been begun.

Finally, that the woman had labour'd under a uterine fluor; from whence I took occasion to send this observation to you in the present letter; was shown by a great quantity of matter, which was thick, and of a white colour inclining to cineritious; and with which the cervix uteri, and the neighbouring part of the vagina, were daub'd over.

And

And as I saw the lower part of this last-mention'd cavity, and the orifice itself; which was very large; and the lower parts thereabout, to be very red; going on from thence, therefore, with the scalpel, to the upper parts, I not only saw the same kind of matter, but found the osculum uteri, and the cervix, both of them to be very wide; and that in an equal degree.

And through the internal surface of the fundus uteri, which was in other respects smooth, I saw sanguiferous vessels; in a great number, and thick, and dispos'd in no certain order; which, by pressing the fingers upon them from below, were tumid with blood that seem'd ready to burst forth; just as I have been wont to see it in those women who had lately menstruated.

15. I imagine he would not see a state of the vascular system different from the present, who should inspect the internal membrane of the nostrils, when affected with a coryza; for that a uterine fluor of such a kind, has an affinity to this disorder, I have already sufficiently shown, on a former occasion (x), that the ancient physicians, not to mention the more modern, have allow'd.

And I have said enough on the other circumstances; which are observ'd in this dissection also; I mean, those that relate to the causes of the sanguineous apoplexy and hemiplegia.

And indeed, in another place (y), you are told, what effects of a very cold season have been found, by me, within the cranium: and after you have compar'd therewith these others that have been observ'd in a somewhat less cold season, and both of them, with the dissection, which was made by the celebrated Leipzig professor Quelmalzius (z), upon the body of an old man, who was kill'd with cold, when he was upon a journey, in the month of January; you will be surpriz'd, that in the ventricles of the brain of this man, there was only a "viscid" lymph, and not a lymph coagulated by the frost: for although the body had been previously kept warm in a gentle heat; yet as this had been done still more in that of ours, and the serum which had concentered, in the same ventricles, was not for that reason unfrozen; and indeed as that old man dissected by us, or this old woman, had not been oppress'd by the effects of cold in journeying, but had both of them died in their beds in the hospital; so I must suppose, either that the cold which kill'd the old man of Quelmalzius, was not so severe as our cold then was; or rather that the body had been brought into a warm place much sooner than our bodies, which had lain in the open air.

But as to what relates to the disorders of the arteries, observ'd in the same old woman; you may remember how many times I have seen the same in other bodies; and how many disadvantages, to the blood's circulation, I have accounted for from thence (a). And as these disorders were here more in the inferior arteries, than in the superior; and the blood could for that reason not be mov'd so easily through them; I should believe that it was

(x) Epist. 47. n. 11.

(y) Epist. 13. n. 15.

(z) Progr. quo frigoris acrioris in corp.
hum. effectus expend.

(a) Epist. 26. n. 32.

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driven in so much the greater quantity, into the upper vessels, and extravasated within the cerebrum of the old woman.

But when you observe, that, in proportion as the arteries went down farther from the heart, they had the more large bony lamellæ; do not be immediately of opinion with those, who object this to Boerhaave, when he deduces the ossification of the arteries from the impulse of the blood, where it is the strongest; that is, where it is nearest to the heart; as you may call to mind what I have said, in more than one place, may be replied thereto.

For it is more than once that I have seen the same thing as in this woman; although never in so many arteries, as it has happen'd to the celebrated Buchwald (*b*) to see. Who having found the great artery, in a decrepit old man, from the heart to almost the whole of the curvature, not much unlike a cartilage only; and from thence become bony, together with its branches, through almost the whole of the body; observ'd this in particular, "that the arteries of the extremities were the more ossified, the nearer they came to the hands or the feet."

And I wish that he had been able to add the symptoms which this old man suffer'd: and the kind of death whereby he was carried off; as well as have added, in the *Ætiology* which he has adjoin'd (*c*), some signs of constitutions of this kind from conjecture merely.

16. Now it would be necessary to return, from the consideration of these disorders common to both sexes, to those that are peculiar to women; if I had not written so much upon these subjects, in that very long and forty-eighth letter, that I have but just these few things to add, in regard either to unsuccessful utero-gestation, or unhappy birth; and this either as it relates to the mother, or the foetus.

And in regard to utero-gestation; to omit that I am not displeas'd with myself on account of those things which I hinted on the force of the mother's imagination upon the foetus, after having lit on some things which have been publish'd by the most learned men, and which show nothing more than that it is not possible, even for the most ingenious men, to avoid the difficulties which arise from a different mode of explication, in some examples that can neither be denied, nor understood: and indeed that they evidently throw themselves into greater difficulties, if you consider what must necessarily be the consequence of the explications propos'd; to omit these things therefore, among the observations of Boehmerus; which I have frequently, and with great good reason, recommended (*d*); besides others that relate to the hypochondriac or hysterical affection, to the dropsy of the ovarium, to an infant who was born with the hydro-rachitis, I would have you read one which has a peculiar reference to the present occasion, and therewith increase the number of foetusses found in the Falloppian tube.

And the celebrated Kierlingius (*e*) has produc'd two observations; of unsuccessful labour, or of the time succeeding to child-birth being fatal; which,

(*b*) Obf. Quadrig. Obf. 3.

(*c*) §. 13.

(*d*) Vid. Act. Lips. A. 1758. M. Januar.

(*e*) Differt. de Utero post. partum inflamm. §. 14. & 6.

as well as the former, I would have you add to the Sepulchretum. The one is of a lying-in woman, who died of an inflammation of the uterus, nine days after delivery. And the other of a woman in labour, of two infants, who lost her own life, together with the lives of her children.

I, however, happen to have only one relative to this subject: and this, such as it is, I will describe to you the more willingly, because I have heretofore said (*f*), that I should probably give you the relation.

17. A foetus, of the female sex, was brought, from some other place, into the hospital, by the students, that I might dissect it; and this was about the middle of March, in the year 1751.

The person who had given it to them, said that it was a foetus of nine months; that it had liv'd two hours; and that the death of its mother had succeeded, soon after, to that of itself: that what kind of disease the mother had been carried off by, was unknown to him; but that these things had certainly happen'd two days before.

These last circumstances might possibly be true: but whether the former were true likewise, I doubted very much; for the size of the whole body shew'd the foetus not to have been so far advanc'd; and the funiculus umbilicalis not being tied, shew'd that it had not liv'd as was said; and what we found upon dissection seem'd moreover to confirm my suspicions.

For when the thorax was open'd, I found the lungs to be of a red colour, degenerating into a dark brown; and I saw that parts of these lungs, when laid upon water, fell immediately to the bottom.

Upon opening the abdomen, a very great quantity of blood was found extravasated into the cavity of the belly. Upon exhausting, and wiping away of which, no intestine appear'd; if you except the rectum, and some part of the colon, continued therefrom; but neither the mesentery, nor the greater part of the mesocolon, were any where to be seen.

Then observing the whole convex surface of the liver to adhere to the diaphragm, and to the neighbouring muscles of the abdomen; and the other surface, or the concave, to be not a little unequal; and guessing how the case was; I found all the intestines, and mesentery, which seem'd to be deficient, confin'd under this hollow surface, and cover'd over with a pretty thick membrane, which was of a tenacious nature, and rough with some small sandy particles as it were; being also connected with that surface of the liver.

The same surface being eroded, or lacerated, for a very considerable space, shew'd from whence so great a quantity of blood had flow'd into the belly. And nevertheless, from the vena cava, which was soon after cut into at the diaphragm, a great quantity of blood flow'd forth: and this was black; of which kind that effus'd in the belly, and that found in the vessels of the whole body, was also.

I omit other things which do not belong to the present place, as they were demonstrated, by me, to be in a natural state in this foetus: this one thing, however, I will mention, that although there was meconium in some of the upper intestines, there was none in the rectum: which circumstance, and the

smallness of the viscera, that corresponded, in size, to the other part of the body, confirm'd that the foetus had not arriv'd to the age of nine months; and especially as these circumstances were join'd with a very great softness of the parts, which was very remarkable in the brain, as well as elsewhere.

For when I had open'd the cranium, we saw the substance of the cerebrum and cerebellum flowing abroad, almost in the manner of a kind of jelly.

However, there was no strong smell in the whole body, nor was any mark of putrefaction observ'd. And all the membranes gave an immoderate resistance; if you attempted to tear them asunder with the knife, or with your fingers.

18. Any one who knew, for a certainty, what symptoms had preceded or accompanied delivery; or had even examin'd the placenta; might perhaps conjecture the cause of those things which we saw in this foetus: or if not of all, at least of some; and particularly of the effusion of blood. And you will call to mind, that mention of this effusion of blood, in a foetus, has been made formerly (g) to you by me; and that from a laceration of the liver also. But we must now pass on to a far different kind of disorders. Farewel.

LETTER the SIXTY-EIGHTH

Contains some Things in regard to Fevers, but still more
in regard to Tumours.

1. **A**FTER the forty eighth letter; which was the last upon the diseases of the belly; the subjects of the others, that I sent to you afterwards, related to those diseases, which either exist in the body universally; or if in parts, which require a surgeon more than a clinical practitioner. As I now, therefore, intend to preserve the order which I then follow'd, I shall begin with the consideration of fevers, and tumours; treating of the first in a very few words, and of the second somewhat more diffusely.

2. In regard to fevers, as they injure, and become fatal, chiefly by means of another disorder which is joined to them; and even frequently arise therefrom, and are fomented thereby; you readily perceive of how much importance it is to know the nature, and seat, of this disease, which is joined thereto.

However, as dissection sometimes sets both of these clearly before our eyes; as, for instance, an inflammation of the viscera, or some ulcer; so very

frequently it shows neither of them; of which case there are obvious examples: and some of these we have even produc'd from the papers of Valsalva, when writing to you (a) on the subject of fevers.

And this is the more to be lamented, when it happens in those fevers; as it frequently does; which are not only most pernicious, but attack in greater numbers at the same time; I mean malignant and epidemical fevers. For it is not then of so much importance to counteract the fever, as it is to counteract that malignant quality which is join'd thereto; and which is, to the great increase of the difficulty in such a counter-action, almost peculiar in every constitution.

And certainly, unless you endeavour to overcome this malignant quality for the most part; you do the same thing, as if you should endeavour to overcome a fever, which had its origin from the bite of a viper, by antifebrile remedies; without paying any regard to the poison infus'd; to make use of the same example, which I perceive, from the History of the Royal Academy of Sciences at Paris (b), the celebrated Du Quesnay has made use of also.

For which reason, we ought the more to give thanks to the providence of Almighty God, that, in so very great an obscurity, and variety, of cases, it has favour'd us with a remedy, the powers of which, in overcoming some dangerous fevers at least, is prov'd by experience; though the method in which it acts is somewhat obscure; I mean the Peruvian bark.

For this remedy, although some of these fevers seem to have one kind of malignity join'd with them, and some another; as appears from the external causes and symptoms; can nevertheless counteract the one and the other equally; and subdue their malignity; as I have learn'd both from my own observations, and those of others.

Nor was the matter which has begun to be thrown out of the blood, either upon the skin, or about the joints, by any means repugnant to the salubrious efficacy of the bark; not even when repell'd inwards, from thence, by the force of the external cold.

For a very eminent cardinal was cur'd by the bark of a malignant fever, into which he had fallen, in consequence of such a repulsion; as I have written to you on a former occasion (c): and that very famous man Haller was also cur'd thereby of a very violent fever, which had come upon him in consequence of a gout being thus repell'd; and which was attended with an erysipelas of the face likewise: and this he relates in the remarks that he has made upon the hundred and fifty-second disputation, among those which he has collected and published, as "contributing to the history and cure of diseases."

For it is past a doubt, that these things are not so much to be attended to, as this which I then spoke of; I mean, whether the fevers are periodical: that is, whether they are wont to have an intermission, or a remission at least; so as to afford us room to hope, that, by a timely and proper use of the bark, both the fevers themselves, and their attendant malignity, will be overcome.

(a) Epist. 49. n. 2. & n. 12. & seqq.

(b) A. 1753.

(c) Epist. 49. n. 30. & seqq.

Nor does the bark only overcome what is febrile; but even that which is not febrile; so that it does but recur periodically: although this effect is not so general, when the disorder is without any manifest fever: and as we have already said (*d*), that this has been observ'd, so we might now also confirm it by a more recent, and more clear observation of Stephanus Welspremus (*e*); I mean, of an equally severe, and obstinate, hemicrania being overcome by the same remedy, after having been already exacerbated every fourth hour, for two weeks together; and not having remitted till after two hours.

And if this observation, which was made and publish'd in the year 1756, could have existed fifty years before; when I at length with difficulty put to flight that very severe hemicrania (*f*), which return'd every day at the same hour, by the prescription of a number of different remedies; I should certainly have made use of none more readily, and perhaps more successfully than this; notwithstanding I had been ignorant of the mode in which it produces its effects.

3. And I could with the malignant and epidemical fevers, whereof we had begun to speak, were all periodical, as they are almost all of them join'd with a various and obscure force of malignity; we should then have in this cortex a medicine, which, although we might be ignorant in what manner it operates, we might nevertheless try with a reasonable hope of success.

But they are very often synochæ, or continual fevers; and such as, if you dissect the bodies of those who have been carried off by them, either show nothing, as I have said in the beginning, which discovers the peculiar nature, and situation, of the principal disease; or show considerable and evident injuries of the viscera indeed, but such as; if you compare them with those symptoms that have been observ'd in the patients while living; you will naturally conceive to have been produc'd by some other latent and principal disease.

That is to say, by way of example, an inflammatory fever of the viscera, after dissection, shows the viscera to have been inflam'd, whether it is benign, or malignant; but in the living patient if it be benign, it is alleviated by repeated blood-lettings: if malignant, it becomes worse, and is very soon fatal.

The cause of the difference is another principal disease being join'd to it; as in that fever at Roan describ'd by the celebrated Malouin (*g*), which, about the end of the year 1753, carried off a great number, in a very short time, in that place.

For by reason of the malignant acrimony of the matter which irritated the stomach and intestines, that inflammation was at length produc'd, which was found in those viscera, and was already degenerated into a gangrene: the other internal parts being unhurt, and particularly those of the head; which otherwise had been troubled with a pain, that arose from a consent of parts, and increas'd every day so as to bring on a delirium.

The college of physicians at Roan, therefore, prudently and usefully determin'd, that the inflammation was not then to be attended to; as it either did not exist in the beginning, or arose accidentally in the progress of the disease:

(*d*) Ibid. n. 29. in fin.

(*e*) Observ. Med. 4.

(*f*) Epist. 1. n. 11.

(*g*) Mem. de l'Acad. R. des Sc. A. 1753.

but that every method must be taken to eliminate that very acrid matter from the first passages; for from this, if it were left within, a permanent irritation is much more to be fear'd, than a transient one from purgative remedies, especially when they are of a milder kind.

And you will do rightly, if you add to the Sepulchretum what appearances were found in those carcases, and in others also, when epidemical fevers were frequent; a dissection of which kind you will find in the same author: and, in like manner, what appearances were found while pestilences attack'd men in this age; or what happen'd much more frequently, and in a greater number of places, when they attack'd oxen. For we have accounts of the appearances found upon dissection, in the viscera of these animals, committed to print, both by our own physicians, and the physicians of other countries. Yet you will never fail to remember, that whatever marks of disease were found in the viscera, upon dissection; whether of a gangrenous, or any other kind; were certainly rather the effects of some latent and principal disease, than the disease itself.

And indeed you must remember, that some things, which are propos'd in those dissections, as if preternatural, might perhaps be agreeable to the customary laws of nature; as, for instance, when in oxen which died of the pestilence, you will see remark'd, here and there, too great a fullness of the gall-bladder: and you will even see it consider'd, by some, as the cause of the dysentery wherewith the oxen had been afflicted, and of the inflammation and sphacelus of the intestines; supposing that, in proportion as the bladder was more fill'd with erosive bile, the greater quantity would of course be discharg'd into the intestines.

Only one of these authors, that I know of, and that is Mauchart (*b*), thought the matter might be differently explain'd; either by conjecturing that the bladder is distended, not so much by the bile, as by the particles of the air expanding itself in the putrescent bile; or, when he says that this expansion of the air is "sometimes" (not always) observ'd; by supposing, that, from the coats of the intestinum duodenum being tumefied; or spasmodically constricted; or even compress'd by the expansion of flatus; a free and fuller influx of the bile into that intestine, through the extreme part of the ductus communis, is prevented; this extremity of the duct being contracted for the reasons above mention'd: from whence the bile is diverted into the vesicle; and not only by regurgitating, but by flowing in very plentifully; and by these means distends it: and especially (which he might have added) as there are several passages naturally lying open, through the hepato-cystic ducts, into the gall-bladder of oxen.

To me however, before I read Mauchart, occur'd another reason for doubting, which is perhaps less intricate, and greatly more agreeable to the common laws of nature. For as nature has so order'd it, that a fuller afflux of bile shall be promoted, at the time when the stomach, and the nearest intestines, being fill'd with aliments, press upon the vesicle themselves by their own tumour; and as the animals of that species, from the very first days of their having contracted the pestilence, are averse to all kind of food; I

(*b*) Disput. de Lue Vaccar. Tubingensi §. 18.

thought it must follow from hence, that the vesicle, being never compress'd, retains a far greater quantity of the bile, which is continually flowing in, than it generally does at other times, and is immoderately expanded thereby.

And this reason for doubting, such as it is, I advanc'd in the anatomical theatre; and have the satisfaction to find that it gave pleasure to my auditory; and particularly to that celebrated professor, and, while living, my very humane friend, Charles Gianella; as I learn'd from the dissertation which he has publish'd (*i*).

4. But in regard to tumours; for after fevers I wrote of these to you; both the situation, and the nature, of them appear very frequently of themselves; and still more evidently by dissection: so that you may transfer into the Sepulchretum, without any doubt, those things which are propos'd, and made mention of, by that diligent observer J. Alb. Hent. Reimarus, in his very useful dissertation on the tumour of the ligaments, which is call'd the fungus of the joints.

Nor will you only find observations of that tumour, in the ligaments about the joints; although chiefly of that; but of others also, in this dissertation: others, for instance, that have been met with at the joints in like manner; particularly of the knees; suppose either from an acrid humour (*k*) collected in the cavity of the joint, and eroding the bones, or the cartilages, or changing these cartilages (*l*) into another substance, and making them tumid; or from the mucilaginous glands (*m*) becoming tumid, and giving occasion to injuries both of themselves, and the bones; and on the other hand receiving, from their diminish'd pressure, a cause of becoming still more tumefied.

I omit other examples which you will find with these; and every one distinguish'd, as far as it is possible, by their peculiar signs: so that we cannot help wishing to read the other things, which, in consequence of his being press'd for time, he had not in his power to add; particularly on the dropsy of the joints (*n*), the marks whereof he had propos'd.

But he even very clearly explains the causes of the signs, from the appearances that are seen by dissection; as, for instance, the rotundity of the ganglion (*o*), its mobility, and its discussion from a fall, or a blow: and that whether inflicted purposely, or by accident; and not to mention any thing more, the expansion of the bones in the spina ventosa (*p*), an observation of which disease, and a dissection of the part diseas'd, are produc'd: and these are so much the more worthy of our attention, as the disease had attack'd the tibia not of a boy, but of a man of four-and-twenty years of age.

Moreover, you will find in other authors, still more observations, and dissections, of expanded bones, that you may add to the Sepulchretum. For besides those which Abraham Cyprianus (*q*) shows to have frequently occur'd to him, there is another extant which is describ'd, and treated of at large, by Frid. Jac. Titmannus (*r*).

(*i*) Dissert. inscripta, non semper ex cadaverum sectione, &c.

(*k*) §. 48.

(*l*) §. 58.

(*m*) §. 50.

(*n*) §. 46.

(*o*) §. 65.

(*p*) §. 62.

(*q*) Epist. ad Millington.

(*r*) Dissert. Osteo-Steatom. Caf. rarior. &c.

And when you read these examples that I have taken notice of, and others, of the expansion of bones; you will naturally observe that these expansions are owing to the quantity of deprav'd fluid, which is redundant within the bones, and which urges the parietes thereof outwards; as these parietes give way without difficulty, where the same humour has soften'd the bony fibres, and internal laminæ; or has so eroded and dissolv'd them, that a very few external laminæ are now remaining. For in either of these ways the bone loses its hardness.

And a great number of histories of this change, you will see pointed out by the celebrated Morand (s); where he gives the relation of that admirable one which he himself saw. I would have you read this history, and another which occur'd, some years after this, to that eminent professor at Leipzig, Ludwig (t).

You will see that, in the latter case, some bones were become so soft, as to yield to the slightest impression of the finger; and others so extenuated, in their external lamina, that the subjected cells could be easily seen through them: and in the former, that the same external lamina was, in some places, reduc'd to the form of a membranous sheath, in the very bones of the femur and tibia; their solid substance being dissolv'd and carried back, as it seem'd, into the general circulation; and at length thrown out by the urinary passages: for there was a surprizing quantity of sediment in this fluid: and this sediment was encreas'd, when the limbs were in a worse state; being also of a peculiar nature, that is to say, white, earthy, chalky, and soluble, by means of vinegar, or other acids, whereby it is certain, that bones, when macerated therein, are soften'd down, and brought to a state of flexibility (u).

When you read over these remarks, you will perhaps call to mind the observation of Zellerus (x). For "the *acer* which exhal'd from the abdomen" of a boy of nine years of age, "when open'd, was very considerable, and very penetrating:" and this boy was ricketty, and his "bones were so soft, that it was very easy to cut asunder the crooked tibiæ, and others of the bones, with the knife; and that without applying any considerable force."

Wherefore, it was less to be wonder'd at, that he had nodes about the joints; as ricketty persons generally have; and these "very considerable," in that place where the sternum is join'd to the ribs on both sides: and the ribs, when "cut asunder, themselves also distill'd blood."

And it is natural to suppose, that, by the same deprav'd humour where-with the bony fibres are soften'd or dissolv'd, the small vessels, which carry the blood, are eroded; and that this blood being extravasated, the medullary oil is thereby render'd bloody; of which nature that humour also was, which Morand found within the bones whereof we have spoken: and Ludwig found the medulla fill'd with bloody coagula in some of his bones: yet in others of them he found it "scarcely congeal'd, but extremely soft, and almost fluid;" and even "fluid and almost watry."

(s) Mem. de l'Acad. R. des Sc. A. 1753.

(t) Progr. Observ. in Cadav. cujus ossa emolita erant propton.

(u) Vid. Epist. 58. n. 7.

(x) Disput. de Morbis ex Structura glandular. c. 2. n. 15.

And this I take notice of here, that you may compare it with that medullary oil, which I have describ'd to you heretofore (*y*), as observ'd by me within the exostosis of the tibia of a man; and within a cavity also of the same bone, corresponding to the exostosis; and that in a great quantity and very liquid: for unless it be in a considerable quantity, it cannot urge outwards the soften'd laminæ of the bones, as I then said, and even before also.

In the observation of Morand therefore, the os femoris, at the external trochanter, and the extremity of the fibula, were become very thick: and the thickness of the cranium was greater in a duplicate proportion than it naturally is: but when the blood, which lay betwixt the two tables, was press'd out, by a compression of some continuance, a great thinness succeeded to that very considerable thickness.

These remarks, therefore, you may add to those which I wrote to you at that time, upon the tumours of bones (*z*); and upon their state of softness (*a*): for by this means you will perceive, that some things are still more confirm'd; and that others may be explain'd somewhat differently in different persons; and be attended with circumstances that are somewhat different.

5. Come, now let us go on, from tumours of the most hard parts, to consider those of the softest part; I mean, those of the *membrana adiposa*. And of this class of tumours, I happen'd to have the opportunity of examining two others, besides those which I have spoken to you of already (*b*).

6. An old woman had died in the hospital, about the time of beginning the public demonstrations in anatomy, in the year 1755. The body being brought into the college; from the want of better subjects; when I examin'd it, and found that there was nothing known in regard to the patient, but that she had died gradually; I observ'd; to omit other things, and among these the nails of the great toe of each foot growing out in the manner of a little horn, which pass'd in a tortuous direction over two or three of the nearest toes, and that on both sides equally; I observ'd, I say, a hemispherical tumour to be protuberant from the anterior and middle part of the left thigh longitudinally: having a diameter which exceeded two inches; and being so soft, that it might have been taken for a *melicerides*.

The skin, in that part, was of the same colour as in other parts; nor had it any thing icteric in any part: but only a slight scabies appear'd. What this tumour contain'd, and in what manner the contents appear'd, I shall say, when I have told you what appearances were observ'd by inspecting the viscera.

In the belly, the intestines were in a lax state, and among these the rectum; which was diseas'd by reason of the hæmorrhoids being tumid internally: the spleen was somewhat larger than it naturally is: in the gall bladder was a yellowish bile; and in this bile was a calculus of a spherical form, which exceeded even a very large filbert in its size, was black in its

(*y*) Epist. 50. n. 60.
(*z*) Ibid. n. 57. & seqq.

(*a*) Vid. etiam Epist. 58. n. 6. & seqq.
(*b*) Epist. 50. n. 22. & seqq.

colour, but mark'd externally with a kind of thickish points, that were of a white colour degenerating into red, one of them being prominent.

You see now, why I remark'd above, that the woman was not of an icterical colour: you may therefore add this observation to the many others which I have formerly taken notice of to you (c) And that you may not complain of wanting the other circumstances relative to this stone, take them as they follow: immediately after extraction, it was thrown into water moderately warm, but instantly went to the bottom; and being taken out from thence, was soon after laid on the top of the water very gently, but immediately subsided as before.

However, I inspected it that very day, after it had been laid aside for some time, and found that it had spontaneously separated itself, in some measure, into a great number of black pieces: and taking these pieces, which were wrapp'd up in paper, again into my hands about forty days after, I laid many of the small ones, and one of the largest, on the surface of water: at first they all swam thereon; but scarcely had a single minute pass'd, before the largest of them went to the bottom, and this was soon after follow'd by the rest. Moreover this largest being extracted, and immediately laid upon the water, immediately subsided. One or two of those which I had not put into the water, being applied to the flame of a candle, took flame indeed, but did not retain it, nor were melted, but smelt like burnt feathers.

Now let us attend to the appearances which were seen in one of the ovaria, in the tubes, and the uterus; which you may likewise add to other similar diseases that I have written of elsewhere.

The ovary was equal in size to a very large walnut, and was made up of white and thick membranes, including water. Both of the tubes were so confus'd with the broad ligaments of the uterus, that the greater extremity of them did not appear. The fundus uteri had, internally, on one side, two or three excrescences; and on the other, the simple beginning of one only. All of these excrescences, indeed, consisted of a white substance; but in the largest of them this substance was made up of white membranes, containing cells full of water. The figure of this was oval; being situated longitudinally, in respect of the uterus; to the internal coats of which, it was continu'd by a pretty broad peduncle, on the anterior surface of that cavity, though this peduncle was much narrower than itself. And on this anterior surface were the two other excrescences; being continu'd to the same coat, not by a peduncle indeed, but by the whole of their bases, depress'd in their figure, and not containing water.

In the thorax and the neck, for the head we did not touch, I observ'd two circumstances that relate to the vessels. The great artery, within the thorax, was distinguish'd by white spots internally, which evidently foretold that bony lamellæ would have been generated there, had the patient liv'd longer. And the external jugular vein, as it went down on the left side through the neck, was divided, in the middle of its course, into three parts; which, having made two islands, came together again into one tube, after having pass'd down about three inches. But the latter of these appearances was rather rare than morbid; and the former is very frequent at such a time of life.

But now I at length return, according to my promise, to the tumour which, as I have said, appear'd hemispherical before dissection, and on the thigh resembled a melicerides for this reason also, that it did not hang therefrom by a peduncle, but hid its other hemisphere under the skin.

The skin therefore being cut into, it was evident to all who were present, that it was nothing else but an excrescence, as I understand it, of the adipose membrane. For of this very membrane, dispos'd into so many parallel parts as it were, was it entirely made up; and without any other difference than this, that the fat, which was in other parts somewhat brown, was more white in the tumour. However, there was not any other membrane under the skin, which comprehended the tumour in the manner of a cyst; nor was there any thing like a partition under the tumour, which separated it from the continued membrana adiposa.

7. I will now describe another tumour, but in fewer words than I did the former, as the observation was made while the patient was yet living.

8. An honest man, who liv'd in the country about Padua, had a tumour almost like a fig, of a considerable size, hanging from one of his thighs, by a short peduncle, not thicker than a man's finger. The tumour was soft, so that if you handled it, you might perceive it was not a sarcoma, nor yet distended by a great quantity of included humour.

The skin of it, which was of the same colour with the other parts, differ'd in this one circumstance only, that it was seen to be unequal here and there with protuberances, which were of a hemispherical figure; but depress'd, and not thicker than the point of a man's little finger. The tumour had never any pulsation, and never was in pain, even when press'd: nor did it ever give him the least uneasiness, unless when he was obliged to ride. For this sole reason therefore, join'd with a fear, lest it should grow bigger and bigger every day; he came to me, and desir'd to know, whether it might be cut away without danger.

Attending, therefore, to the circumstances which I have spoken of, and not seeing any other vessel passing through the skin of the tumour, but one vein; which did not, even at the upper part, reach to the diameter of a pigeon's quill; and calling to mind many successful extirpations of this kind; I readily consented that it should be cut away; especially as that very experienc'd man Jerom Vandelli, the public professor of surgery in this university, had undertaken to perform the operation.

And this he did with great success, in the beginning of June in the year 1757, with the loss of a very small quantity of blood; notwithstanding he had cut a little deeper than the beginning of the peduncle was: and a cicatrix being easily brought on, the man was perfectly cur'd within a short time.

The tumour, which weigh'd about five ounces, being sent to me on the same morning, by the son of Vandelli; who is worthy of his father, and his very learned uncles; and being immediately cut into, and examin'd by me, while he looked on, was found to be the very thing I had taken it to be; I mean, an excrescence of the adipose membrane.

The peduncle of this tumour was of the same nature with the peduncle of another tumour, which I have describ'd to you heretofore (*d*), as being

cut away by Valsalva; that is to say, it consisted of the same structure, and substance, that the *membrana adiposa* has in a sound state, contracted into a kind of cylinders, as it were, going down within the peduncle, and continued from thence within the tumour; being of a yellowish colour, soft, and unctuous, and making up the whole tumour, and even those small hemispherical bodies which protuberated externally. The parts of which they were compacted, not only adher'd to the skin tenaciously, but to one another also in several places; so that one part could not be separated from the other by the fingers alone: yet there was no coat at all besides the skin, which comprehended this tumour, in the manner we see in cystic tumours; nor could the skin itself be divided into two laminæ, notwithstanding it was pretty thick. But under the skin, here and there, were small sanguiferous vessels, especially towards the upper parts.

9. These tumours which have been examin'd, and cut into, by us, were small indeed, if you compare them with those large tumours, examples of which I have formerly referr'd to (e); particularly in Palsin; and which you may consider alone, or in conjunction with still larger tumours, of sixty pounds weight, or more, the histories of which have been added thereto by men of eminence (f). But as they are suppos'd to be similar to those which are call'd cystic tumours, and particularly to those that are call'd *natte* in our language, you perceive that, notwithstanding they contain'd fat, they must have been different from ours.

But now let us go on from these which are simple, and frequently of a considerable size, to others which are complex, and very small; or at least of a moderate size. And let us insist, in some measure, upon those whereof I spoke but little in the fiftieth letter; that is, of tumours which are form'd in the upper part of the tongue, and of others that grow almost in the whole of the body.

10. Of the tongues which I dissected in the college, in the month of February, in this year 1759, there was one that was tumid: and in this the line which is called the *linea mediana*, at first subsided into the form of a considerable furrow, from the apex to the extent of a full inch, (which did not disappear even when the tongue was drawn to each side) and at length was no more seen; and even the middle part, as well as the lateral parts, of that surface, was occupied by tubercles, dispos'd in no regular order whatever; being low indeed, but thick to the extent of half a line of the inch of Bologna, of an unequal surface, and of a white colour, like the rest of the tongue.

These tubercles terminated near that part, where those last thicker papillæ should have been: the place of which was fill'd up by very small, but very thick-set tubercles. After these at length succeeded the whole of that part wherein glands are wont to be prominent; but the surface was entirely without any trace of these glands, being quite even and smooth.

11. What had preceded to produce this state of the tongue, and what inconvenience such a state had been the occasion of, it was not in my power to learn.

(e) Ibid. n. 22.
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(f) Vid. in *Italica Palsin*. Edit. Part. 5. c. 4.
But
4 E

But on the contrary, after what symptoms, not a consumption, but an enlargement of the glands began ; and what symptoms it brought on ; and the very speedy production of new glands, as it were, both within, and without the body, in great part of it ; appears from a history which ought not to be pass'd over here ; and which being communicated to me by Laurence Mariani, whom I have before commended, and by his son-in-law, who is worthy of him, Joseph Boni, in the year 1752, was the more agreeable to me, because, though I had an opportunity of examining a somewhat similar disease, in former years, I nevertheless had no opportunity of dissecting it, as I have told you when writing upon tumours (g).

12. A noble youth, of fifteen years of age, who had been healthy from his infancy, and was of a good colour, being receiv'd with a very severe chiding, and being so much the more struck with fear therefrom, because he was naturally thoughtful, pass'd three days in a stupid state as it were at that time ; and three months after began to observe small glands in his neck, which at first encreas'd gradually : but soon after the disease was so speedily encreas'd, that, besides a tumour of the salivary and axillary glands, in a short time were observ'd throughout the back, and the breast, but particularly about the clavicles, prominent bodies, of the size of a pigeon's egg, and resembling strumous glands ; tumours of which kind were not wanting soon after in the integuments of the abdomen also, and even, as was perceiv'd by the touch, in the cavity of the belly likewise.

They were all of them, in general, without pain ; but that which lay upon the pectoral muscle, and which was three inches long, and livid in its colour, was somewhat painful to the touch, as the interior parts of the belly also were ; particularly on the left side, where a great tension and resistance were perceiv'd.

Many remedies were made use of both internally and externally ; and that in the beginning too, but still more in the progress of the disease, when the most powerful medicines were prescrib'd by the most skilful physicians in concert : but whether he made use of any, or none, the bulk of the tumours increas'd, and the disease had so rapid a course, that although it had begun only in the month of December, it finish'd its period in death about the end of May following.

Not long after the beginning of the disease, an acute pain had attack'd him in the knee, and in the leg ; sometimes in the right, sometimes in the left ; and with this pain he was always afflicted afterwards ; symptomatic fevers, and fevers of an uncertain period, being added to it ; and watchings, and wasting of flesh attending thereon.

However, the patient was lively and chearful to the very last, had a good appetite for food, and even a keen sensation of hunger, but particularly on the last days of his life : and although there was some uneasiness about the throat, from a kind of mucous catarrh, which was easily thrown up, by means of a slight cough ; yet no difficulty of breathing was ever observ'd : and this you will be much surpriz'd at, when you have read the dissection of the thorax.

The common integuments of the neck, breast, and abdomen, being cut into, it was found that those external tumours had their seats in the cells of the *membrana adiposa*; which was closely connected, in that part, to the subjected muscles. All of them were full of a whitish matter, which was in part somewhat fluid; but, for the most part, solid, and sebaceous. Some of the more prominent of them; as those which adher'd to the pectoral muscles, making one continu'd body with the axillary glands; when cut into discharg'd a yellowish and sanious matter.

The belly being open'd, the whole of the omentum appear'd to be beset, here and there, with hard little bodies, full of that whitish matter. The liver, the spleen, and the kidneys, were themselves indeed in a natural state; but about each of them the following circumstances were observ'd.

To the right part of the liver, the peritonæum was strongly connected: and being become one and the same substance, as it were, with the contiguous muscles (in many places), after that grew out anteriorly, into a body of the bigness of a hen's egg; which, being fill'd up with that matter whereof I have spoken, was connected with the urinary bladder.

Near to the spleen also, the left part of the mesocolon was swell'd into a body which consisted of many pigeons eggs, as it were, connected together, and stuff'd up with that same matter: of which tumours the pancreas also was full: and strumous swellings, of the same kind, were seen scatter'd up and down through the mesentery.

Finally, the tunica adiposa of the kidneys was become thicken'd to a surprising degree; for, on the part where it was turn'd towards the vertebræ, it was two inches thick: and on the opposite part five inches thick; being every where distended with the matter that I have spoken of: and, for that reason, the left kidney, with the addition of a hard and strumous line, which intersected that matter, was about six-and-thirty ounces in weight.

Nor indeed were the intestines free from disease. For not only the adipose appendages of the colon, but the ligamentous bands which pass through that intestine, were seen to be distinguish'd with little bodies of the same kind. And the small intestines had the glands of Peyerus, in some places, of the figure and size of a lupin: and among these glands one that was much more large than the others, being affected with a phlogosis, contain'd a corrupted humour.

The thorax being open'd, the mediastinum was seen to be frequently beset with the bodies I have mention'd, about the middle of it; and among these with one not less large than a small hen's egg, which was not only contiguous to the trunk of the *aspera arteria*, but even compress'd it. The lungs were found internally, notwithstanding to the external surface thereof were infixed hard, and stony globules, of the bigness of grains of barley.

The same surface was wholly hollow'd out on both sides, on the back part; but particularly on the left side, by reason of strumæ, of no inconsiderable size, which were form'd upon the pleura running into it; some near to the vertebræ dorsæ, and others so dispos'd into a kind of series as it were, that one lay upon each rib regularly, from the lower part to the upper. The heart was in a natural state, except that the external surface of the right

auricle

auricle was universally granulated as it were, from little bodies of a similar nature.

Therefore (for thus was the history, which they sent to me, concluded) the tumours we have describ'd were, for the most part, encysted, and turgid with tophaceous, hard, and, in a manner, sebaceous particles, deposited within the cells of the membrana adiposa; besides the equally hard glandular bodies, which are describ'd.

13. I call'd this history to mind, when I lately read another of a black boy of ten years of age, which that excellent anatomist Meckel (*b*) has committed to print. For the early age of both the patients, and the keen hunger; join'd together with the disease, and constantly attending upon it; and the diffusion of the disorder even through the internal membranes; particularly of the belly, in the form of tubercles; the greater part of which was fill'd by a sebaceous matter; these things, I say, make me wish that you should compare both the histories together.

And if, as you read, at the same time, the accurate observations of this very ingenious man upon that, and upon another black (*i*), as far as relates to their blackness also; you should happen to be surpriz'd, that, in the dissection of that apoplectic black, which I formerly sent to you (*k*), and which was made fifty years ago at Venice; no remark was made in regard to the blackish, or brown parts, in the brain of these men, and none in regard to their black, rather than red blood; I would have you know that I had it not in my power to dissect that body before night: and you know that the light of the sun is one thing, and the light of candles another: and in like manner that I had it not in my power to preserve any other part to the day following, but some segments of the cutis and cuticle; and what I happen'd to observe in these parts, I have shown in the *Adversaria* (*l*). But of these things, and of the nature of the cuticle, neither is it the proper place to write here, nor doubtless shall I write, before I have some opportunity either of dissecting a negro; or before I, at least, know some things relative to the infants of these persons, for a certainty; as, for instance, whether they have the beginning of the funiculus umbilicalis not like our children, surrounded with the cutis, which afterwards contracts itself into the navel; and whether, on those few days after birth, when they first begin to grow brown, they have not the soles of the feet, and the palms of the hands, quite so white as we afterwards see them to be in adults; and other things of this kind. For now we must not digress from our purpose.

Comparing together, therefore, both the histories of such a number of sebaceous tubercles; as you will see that they agree in this circumstance also, of some of the viscera, which were contain'd under a coat so diseas'd, being nevertheless sound; so you will observe them to differ not only in the symptoms, but in the seat of the tubercles, which was so far from being in the cellular substance, in the Berlin observation; as schirrhous corpuscles also were in a certain history of Roederer (*); that they had this singular circum-

(*b*) Hist. de l'Acad. R. des Sc. de Berlin
A. 1753.

(*i*) A. 1756.

(*k*) Epist. 5. n. 17.

(*l*) 11. Animad. 4.

(*) Diss. de Uteri Schirrho n. 18.

stance in them ; I mean, of adhering in the proper and firm membrane itself; of the peritonæum, or pleura, the cellular membrane being quite unaffected: and finally, that there were no tubercles externally, but all of them were internal.

But to external, and, at the same time, internal tumours, relates another observation, which Meckel speaks of before the one I have already taken notice of; and which was made by himself, and the very celebrated professor Zinnius, upon an infant, whose conglobate glands were schirrhous, in almost the whole of its body; besides that some parts of the cerebrum were indurated.

14. But whether to both external and internal, or to external tumours only, which are what we chiefly attend to here, the examples that I shall immediately take notice of, are to be referr'd; some of these tumours either included such contents as were evidently preternatural, or contain'd substances whereby they would scarcely, and indeed not at all, have seem'd to be different from the modification of sound glands, if they did not occur in parts where we are not wont to see any manifest glands.

To the first of these kinds, besides those which we have just now produc'd, relate a considerable number of histories, which are transferr'd into the Sepulchretum (*m*); so that when strumous glands, especially if in great number, or large, were protuberant externally, a great number were also found to exist internally; being seated not only on the mesentery, but also on the omentum, the stomach, the intestines, the pancreas, the urinary bladder, and the lungs, according to the observation of Fontanus (*n*); and according to the observation of Heurnius (*o*), even on the peritonæum, the liver, the spleen, the kidneys, the ligaments of the uterus, the diaphragm, the mediastinum, and the dura mater of the cerebrum itself.

I omit other less diffus'd glands, which you may see describ'd there, and which were all strumous: though some of them contain'd gypseous, pultaceous, purulent, ferous, white and yellow matter. And to these you may also add that great number of tubercles, which Laubius (*p*) saw in the lungs, full of a sebaceous matter, similar to that which was seen in the indurated glands of the neck of the same man.

But to the second of these kinds, by reason of that opinion which M. Aurelius Severinus produces at the same time, of Aetius, and even of Leonida, I should suppose those glands to have belong'd, which Severinus himself (*q*) saw protuberating in the form of tubercles in the limbs, breast, back, under the arm-pits, and in the groins; more than sixty of which, that were dispers'd through the whole body of an old man, excited his admiration, on this account principally, that a great number of the tubercles were seen "about places which are quite destitute of glands: it therefore brought into my mind," says he "that saying of Aetius, whereby he has pronounc'd, *Tetrab.* "4. cap. 5 . . . that white and red caruncles are, for the most part, form'd "in the body, entirely as new substances."

(*m*) L. 4. S. 2.

(*n*) Obf. 6. §. 2.

(*o*) Ibid. §. 5.

(*p*) Aët. N. C. Tom. 2. Obf. 105.

(*q*) De Recend. Abscess. Nat. l. 4. c. 5.

But Olaus Borrichius (r) having, in the dissected legs of an icteric patient, lit on glands which were latent under the skin “ in an infinite number;” did not suppose them to be new bodies; but suppos’d “ that they are “ so small in the healthy body, as almost to escape the sight; and that they “ become more conspicuous in the body when diseas’d.” Yet I can scarcely doubt but these may also be referr’d to the second class.

And as to those which Wharton saw in the arms and thighs of a soldier; as related in an observation that may be likewise read in the *Sepulchretum* (s); I know, for a certainty, that they ought to be referr’d to the same species. For as all of them were moveable under the skin, and when handled even with some considerable rudeness, were indolent, and did not yield to the most powerful remedies; and as he found a pretty large one, which had been extracted by a surgeon, to be “ without any putrid or corrupt humour, “ being made up altogether of a solid, glandulous, and white flesh;” this very experienc’d investigator of glands has not scrupled to pronounce, that in this manner “ perfectly sound glands are adventitiously produc’d; that is “ to say, glands in every respect healthy, except that they are reckon’d in “ the number of preternatural parts.”

These observations certainly relate to external glands, as those of Anthony Cocchi (t) also do; where, speaking of mesenteric diseases, he says, that what Leonida had “ seldom ” seen, had more than once occur’d to him (and it had “ often ” occur’d to Severinus); I mean, that the external conglobated glands were not only encreas’d, but in a manner created as it were, in parts wherein they do not seem naturally to exist.

And indeed he moreover adds an example, wherein; besides some which are not wont to be seen (as in the sides), and which were fleshy, and not fill’d with any purulency; he found others of the same kind within the belly. Which observation, as well as that of Severinus, as one that I have not yet met with in the *Sepulchretum*, you will add thereto. And at the same time farewell.

LETTER the SIXTY-NINTH

Relates to Blows and Wounds of the Head and Thorax; to Disorders of the Joints, and to the Lues Venerea.

I HAVE not so much to say, at present, in relation to the disorders compriz’d by me in the fifty-first letter, and the others which follow after, but that I can, finally, comprehend the whole of it in this one letter. To that letter therefore, in which I have written of wounds and blows of the head, you will add the following things.

(r) *Sepulchr. S. 2. cit. Obs. 17. §. 2.*

(s) *Ibid. Obs. 15. in Append. ad §. 1.*

(t) *Dei Bagni di Pisa.*

2. A man not yet fifty years of age, being much given to drinking, and intoxicated with liquor at the very time, fell down as he was going up stairs; and that so much the more easily, because he was lame of one leg, and had been so for some years, from pains, which were commonly said to have been the consequence of the lues venerea.

In falling he receiv'd such a blow on his left temple, that he immediately lost all power of feeling and of moving; and in this manner he died within so short a space of time as four hours. The body of this man being consign'd to the theatre, at a time which was very convenient for beginning the public demonstrations in anatomy; that is, a little after the middle of January, in the year 1756; it was accurately dissected there: and in the course of the dissection we observ'd the following things.

In the belly, when open'd, the stomach was found to be still greatly distended with bread and wine; so that he did not seem to have vomited at all, or at least very little, in consequence of the blow. After all these contents were exhausted, not the least appearance of rugæ was seen on the internal surface of that viscus.

The liver and the spleen were large, yet not morbid; except that the substance of the spleen, when cut into, seem'd to me to be pretty lax, and the colour of it dilute. But both of the kidneys were hollow'd out by a great number of hydatids; which, beginning under their very coat, reach'd so far, as to be contiguous to the tubuli that receive the papillæ; being of an unequal surface internally, but comprehended every where in their own proper membrane.

The urinary bladder was larger than it generally is; particularly in respect of length; so as to be almost twice as long as it is in common. These appearances, however, in the body of a man so much given to drinking, were not to be wonder'd at.

But whether that which I observ'd in the seminal caruncle, related to the lues venerea, or had been so from the original formation, I would not readily take upon me to determine. The sinus which is in that caruncle, had its orifice in the most dilated state I ever remember to have seen it in; and was not plac'd in a longitudinal direction, but in a transverse, which I never saw before in any body.

Yet the semen express'd from the vesiculæ, did not come out through that orifice, but by the two apertures which are on the sides of it; as is usual in other bodies.

The internal surface of the aorta, opposite to the orifice of the cæliac artery, was not smooth; as it likewise was not in other places throughout the belly; and even in that part show'd two bony scales.

In the thorax also, the same great artery had a like disorder within, but particularly near to its valves; two of which were not free from ossification. And above them; although the heart was of a moderate size; the larger sinus of Valsalva was wider than it naturally is. And these appearances were morbid.

However, this which follows, and which I do not remember to have seen on any other occasion, was from nature. The right subclavian vein consisted of two, which, beginning in the axillary, did not join into one tube, before they

they had come near to the orifice of the internal jugular; and an insula of five inches in length had been form'd.

These two veins which comprehended the insula betwixt them, were both of equal thickness: and, on the left side, in the axillary vein, was an insula also, though much shorter than the former; not being two inches in length, and not comprehended betwixt veins of equal size; the one, for instance, being much more slender than the other.

Before I speak of the head, it is necessary to interpose a few things, some of which I am unwilling to omit in the present place, and others I cannot omit. Although there was a considerable quantity of fat on the abdomen, and within the abdomen; yet in the neck, back, and loins, there was not so much; but in so unusual a manner did it adhere to the superficies of the muscles, and of the fasciculi of which the muscles are made up, and was even fix'd thereto, that it gave considerable trouble to those who dissected them.

When we came to the lower limbs, in that which was found, a circumstance happen'd to me which is very rare; I mean that, in regard to the posterior crural nerve, having introduc'd the handle of the knife, or my hand; according to my usual custom; betwixt the two branches into which it at length is seen to be divided in the ham, I could not by going upwards, confirm what is generally the case, that it is not one, but is made up of two, through the whole course of the thigh; and even sometimes above that also: for, although they did cohere together indeed, yet they in fact never coalesc'd into one body.

But when I cut into them longitudinally; which I have been wont to do in each of them, or at least in the larger, in order to demonstrate the parallel fibres, of which it consists; I was surpriz'd to see so much fat interpos'd betwixt them, that the nerve seem'd, every where, to contain more of this substance, than of fibres.

For although it is many years ago, since I have frequently observ'd, that an evident pinguedinous substance is interpos'd betwixt these fibres in bodies that are pretty fat; contrary to what is believ'd by many, and particularly by those who chuse to compare the nerves to tight musical chords; I had, however, never before seen it interpos'd in that quantity which I then saw it in: nor had ever it come into my mind, to suppose it possible, as you easily conceive, that if any other substance be collected here, in a preternatural manner, in the place of fat, those disorders which they impute to obstructed, or otherwise vitiated, nervous fibres, must arise from thence. This limb however was found, as I have said.

But the other, of which the man had been lame, was so drawn up, that the leg could not be extended, by any force of the hands which might be applied. Nor could it be perfectly extended; although it was then extended somewhat more easily; when the tendons of the flexor muscles, which were very tight in the ham, were cut through in a transverse direction; and neither these muscles, nor the extensors, were of a red colour, like the rest, but of a brown and almost dirty colour.

And, indeed, the colour of the very small quantity of mucilage, which was in that knee, differ'd from the natural appearance: the mucilaginous gland was larger than usual, and appear'd like a white and hardish substance

of a pinguedinous nature. But almost all these circumstances seem'd to have been owing to the cessation of motion in those muscles, and in that joint.

Finally, in dissecting the head, I saw the temporal muscle, which had been contus'd by the blow, to be tumid and black, by reason of the blood stagnating in it, and relaxing its internal structure. But the cranium I did not find to be injur'd in that part, nor in any other, by fracture, or by fissure; nor even by depression.

The vessels which creep through the pia mater, were here and there seen to be very turgid with blood however, which was very black; and a coagulum, of no inconsiderable size, was form'd above that membrane, from blood which had been extravasated there. Of this extravasation therefore, and of the concussion which the brain had receiv'd, his death had been the very speedy effect.

3. This history you will add to the others, which I wrote in the beginning of the fifty-first and fifty-second letters; and which show the cranium to have been unhurt in like manner, from blows, but not the parts which lie under the cranium; although in none of them did so speedy a death follow. Now take one which you may add to another describ'd in the following fifty-third letter (*a*). For it is the second case, wherein I met with a wound of the heart. Thus we shall pass on from one principal viscus, the cerebrum, to another principal viscus, the heart; and from a case of speedy death, to an example of the most speedy that can be conceiv'd.

4. A shoemaker, of about forty years of age, going up stairs, was met by his enemy who was coming down: this enemy thrust a knife into his breast, and immediately fled. He, however, crying out that he was wounded, and drawing back the knife from the wound, died so suddenly, on that very spot where he receiv'd the wound, that those persons who ran to him immediately upon hearing the alarm, did not find him alive.

The body of this man was obtain'd, without difficulty, by the students: and they took care it should be brought to me, who was then teaching anatomy in the college; it being the month of January, in the year 1753.

The body was of a large size, and of a sound habit; so that if it had not been somewhat more fat than we could have wish'd, a better subject for observation, and demonstration, could not be desir'd; and both of these circumstances were strictly and accurately attended to by me: although I shall take notice of nothing here, but such things as relate to the wound, and to the blows receiv'd in falling.

The wound therefore; which was inflicted at a very small distance from the left side of the sternum, betwixt the cartilages of the third and fourth rib; was scarcely longer externally, than half an inch of the foot of Bologna: it had pass'd from thence through the mediastinum, and the pericardium, to the right ventricle of the heart, and had pierc'd through the paries thereof very near to the septum, in almost a middle situation betwixt the basis and the apex; not being more than three lines in length in that part.

The pericardium, therefore, we had found to be distended with black and grumous blood: and the anterior part of the mediastinum, where the wound

had pass'd through, and above, and below, to a considerable extent, we found to be blackish, and in a manner turgid, from blood; but there was no blood in the ventricles of the heart, nor in its auricles. Nor was there any other injury besides these within the thorax.

But externally, in the upper part of the back, were traces of a contusion; which extended themselves quite from the skin into the fat, that is interpos'd betwixt the round muscles of both the scapulæ.

The integuments of the head, also, preserv'd some marks of contusion in the forehead, which, I suppose, had been got in the fall; as I believe, that he had, at length, lain in such a manner on the stairs, on the steps of which he had again fallen, in endeavouring to rise, that it was much more easy for the blood to flow into the head, than into the opposite part: at least the vessels which were below the heart, contain'd a very small quantity of blood; and those that were above, a very large quantity.

The surface of the brain, therefore, was red from a distension of the vessels which pass through the pia mater; and from a distension of their small branches, which was so great as to resemble an injection of red matter. Nor did those vessels, which appear within the medullary substance, at other times, like threads, appear to be less full; for it was here evident, to every one, that they were hollow tubuli.

5. If you compare this wound of the heart, with that which I have describ'd to you in the fifty third letter (*b*); from the observation of Valsalva; and observe that both of them penetrated into the cavity of the same, that is of the right, ventricle; and that by an almost similar fissure which was open'd in its paries; you will perhaps be surpriz'd, that the man, whose history is, given by Valsalva, did not die till the eighth day; and that this man was so soon kill'd by his wound: especially as so great a quantity of blood was found to have been effus'd into the thorax and belly by the former.

However, you will, I suppose, naturally imagine, that this difference arose, on account of that very extravasation of the blood; which flow'd, not only on the outside of the heart, but on the outside of the pericardium: for it could not stagnate betwixt the pericardium and the heart; as in our observation; and thereby distend the former, and press upon the latter.

And if you do this, you will, from comparing together both these observations, have wherefrom to confirm that which we have, in a former letter (*c*), plac'd among the other causes, why a hæmorrhage within the pericardium brings on death far sooner than when it happens in most other places, even though it be far less considerable.

6. I have said, that when it happens in most other places; and I have said, in like manner, among other causes; as I am not ignorant, how speedily even a small quantity of blood, effus'd within the cranium, or a great quantity, but even when extravasated within the belly itself, is wont to kill persons thus affected; as for instance, from a ruptur'd spleen, which you will learn from many of those observations, that I have pointed out to you, when I was treating of wounds in the belly (*d*), that you might have an opportunity of reading them over.

(*b*) N. 3.

(*c*) Epist. 26. n. 18.

(*d*) Epist. 54. n. 5.

And if among these, I should have happen'd to omit those, which are propos'd by Michael Vanselowius (e), or by J. Valentine Scheidius (f) (for I am not at leisure to look back again to every article) I would have you turn to them, and you will then be the more convinc'd that what I advance is consistent.

7. And the calling to mind these observations would certainly have been very opportune, in order to admonish me to add, on the present occasion, any thing which I might have lit on in the mean time; by reading, or by dissection; that related to those things which I then wrote of at large. But as nothing at present occurs to me, either on these subjects, or on ulcers, I shall pass on to those things which relate to disorders of the joints, that are injurious to motion. For there are some of these which I have either seen myself, since I sent you the fifty-sixth letter, or have read of, as they were seen by others. To the first class belong the two following histories.

8. There was an old man at Padua, of whom I heard, after the dissection; and that from those who had been familiarly conversant with him for a long time; that he could not have inclin'd his head to one side without difficulty. This man, having died in the hospital, in the beginning of March, in the year 1755, of a catarrh; as was said; gave me an occasion of observing the following things; as I was at that time demonstrating some circumstances relative to the anatomy of the head, neck, and thorax.

The thorax being open'd, one pretty large, and one rather small, hydatid was found on the anterior surface of the right lobe of the lungs.

The head, when cut into, show'd water within the cranium; and a part of this was found in the lateral ventricles. The pineal gland was slender.

As the small muscles which are interpos'd, anteriorly, betwixt the first vertebra colli and the head, scarcely, and indeed not at all, appear'd; and this did not seem to me to be imputable to the very bad, that is, to the very lax, state of them, which was to be observ'd in the other muscles also; upon examining the matter more attentively, and inquiring into it more deeply, I lit on that circumstance, on account of which I was willing to write this observation to you.

That is to say, not only what had occur'd to Columbus (g), when he said, "I have seen the first vertebra adhering to the os occipitis, in such a manner, that it could not be mov'd by any means," was here also; but, besides this, an adhesion of such a kind was seen on the left, and particularly on the anterior side, that this vertebra and the os occipitis were one and the same bone: and that this had existed from the original conformation, was shown by many neighbouring disorders in the structure.

For the second vertebra had its body, I do not say grown into one substance with the third; though there was no trace of division (but only a slight appearance of a division having subsisted in some former time) any more than there was betwixt the first vertebra and the os occipitis, as I have said; had its body, I say, and the dentoid process, nearer to the right side of the head

(e) Disp. exhib. Hist. de Ruptura Lien.

(g) De Re Anat. l. 15.

(f) Observat. Lienum Disrupt.

than to the left : this process was shorter than usual also ; and as to the processes that are call'd the superior oblique, on the whole of that surface where they receiv'd the inferior processes of the first vertebra ; which here perform'd the office of the condyles of the os occipitis ; they were by no means similar to each other ; as that on the right side was more confin'd than the left, went up higher, and was inclin'd forwards, rather than backwards.

There are other circumstances also, which I the more readily pass over for the sake of brevity, because, whenever you come to Padua, you may see these bones, as I keep them by me. But the ligaments, which I could not preserve in the state they were found, I will not omit to describe.

The transverse ligament, as it is call'd, embrac'd the whole of the dentoid process on the back-part, except at the lower part, from whence the lateral ligaments arose in a longer and more slender state than usual ; but especially that on the right side. Yet from the left, and upper side, as it were, of the dentoid process, a kind of very short, and pretty thick ligament proceeded.

9. But you will remember, that other disorders of the ligaments I just now spoke of, have been describ'd in one or two of the preceding letters (*b*) ; although it did not seem that those were to be consider'd as the effects of original conformation, as these are. But you will remember still more, because it has been frequently done, that, when mention is made of lameness, among other causes disorders are describ'd in that joint, which is interpos'd betwixt the head of the femur and the acetabulum of the os innominatum. And to this class will belong the following history ; which contains some peculiar circumstances that you have not read of in other writings.

10. A woman, of threescore-and-seventeen years of age, had been born healthy and sound, and had liv'd in that state some time, so as to have been happily deliver'd of a son. But at the second time of child-bearing, which was a very difficult one, having brought forth a daughter (who related these circumstances) she began to be seiz'd with pains about the ischiadic region on the right side, and to be lame.

These disorders could not be at all reliev'd, either by nature or by art ; notwithstanding her third and fourth time of child-bearing were happy ; and indeed she often fell down, because the right limb did not bear the weight of her body with sufficient firmness.

At length being admitted into the hospital ; more on account of her poverty, than her disease ; she there lay in bed a year and some months, for this reason, that if she attempted to rise, her pains were exasperated. Her appetite for food being very considerable, but her strength nevertheless gradually failing her ; and she being now and then delirious ; she at length died in a gradual manner, about the beginning of the year 1754.

Some parts of this emaciated body were not without their use to us, as we were then taking notice of, and demonstrating, many and various circumstances.

For the cerebrum, the cerebellum, and the medulla oblongata, were in a pretty firm state : and although a small quantity of limpid water was contain'd in the lateral ventricles, yet the plexus choroides were red ; nor did the pia

matter easily follow the hand which drew it: and from hence we may pretty fairly conclude, that this water had not been long within the cranium.

And although I likewise saw the uterus to be inclin'd to the same side, on which this woman had been lame, and to be attended with ovaries, which were very much contracted; yet it was proper enough for the demonstration of other things; and amongst the rest, for admonishing the students, that they should not, from what I had said formerly in comparing the situation of the osculum uteri of a cow with that of a woman, in the first of the *Adversaria* (i), suppose me to deny, that the corona of this osculum, when in a natural state in women, descends more on the anterior than on the posterior part, or at least in some degree; although not always so much as the figures of Eustachius (k), when compar'd one with another, represent.

I last of all examin'd the joint of the right thigh, together with its acetabulum: and as I suppos'd I should find a very considerable disease, by reason of that part being enormously protuberant outwards, in the side; so, soon after, when the dissection was perform'd, I found not only one, but many considerable diseases; and that I might be the better able to judge of them by comparison, I first laid bare the upper part of both the *os femoris*, and the inferior part of both the *os innominata*.

The *os innominatum* on the right side then, whether you look'd upon its external or its internal surface, you saw to be extended into a larger circle laterally than the left, and found the acetabulum to be comprehended in thicker parietes, externally, than usual.

And this right acetabulum had a larger orifice than the left; nor was the supercilium thereof, as it is call'd, of a flexible nature, but bony: and as the left corresponded to the head of a sound thigh-bone, in its figure and dimensions, so this exactly corresponded to the head of a thigh-bone, which was alter'd, by disease, from its natural figure and dimensions. For the form of this head was not hemispherical, but conical.

The basis of the cone on the external side, began at the very roots of the larger trochanter; whereas on the internal side, it was distant, by a considerable interval, from the lesser trochanter. The figure of the right acetabulum, therefore, was the same with that of a hollow cone: and the depth of it from the external side was very great; so as to be almost twice as deep there as on the left side: and as to the mucilaginous gland; which seem'd to be larger than it generally is, on the left side, and to be prominent out of its cavity, as it were; there were scarcely any appearances of this gland, or its cavity, and indeed none at all in the right side.

And even the cartilaginous crust, which invested both the surface of the acetabulum, and the head of the *os femoris*, and was white and shining on the left side, was seen to be brown, and of a pale colour on the right side; and to be, moreover, red in several places.

Having sufficiently examin'd all these things, and, at the same time, observ'd how flaccid the ligamentum teres, as it is call'd, of the head of the femur on the right side, was; I then order'd the same head to be cut with a saw; passing the instrument through its axis from the vertex to the basis;

and the section to be carried on into the neighbouring part of the femur also: and this that I might see what difference there was betwixt the two parts internally. This difference was very manifest.

For although this part, and that head, were seen to be every where cover'd with their firm bony lamina; yet the marrow which this neighbouring part of the os femoris contain'd, and that which the head contain'd within its cancelli, were evidently of a different nature: for the marrow in the head was of a white colour inclining to yellow, and when you press'd it betwixt your fingers, more of a watry than of an oily nature; whereas in that part of the thigh-bone it inclin'd more to redness, and was of an oily nature.

Finally, when I compar'd both the ossa femoris together, it seem'd well worth while to take notice of that part which was under the trochanters, at some little distance, not only in respect to its figure; which being very different from that of a round body, came very near to the shape of an angular body; but also in respect to its incurvation in the form of the segment of an arch, which had its convex part looking forwards: this incurvation, however, was greater in the left femur than in the right; and that you would easily conceive, if the pains and lameness had existed at the time, in which the bones, being still flexible, would yield more to the weight of the body in that limb, on which she, when a little girl, was accusom'd to support herself the most; and this in consequence of its being more firm, and giving less occasion to pain, than the other.

11. How is it then? Did not the daughter give us a true relation? or did the mother go lame, in a small degree, from the beginning, and when she was in the flower of her youth, having been born with some of the diseases of that structure which I have describ'd? And when from a very difficult birth; from which cause I have already taken notice (*l*), that lameness has happen'd to others in different ways; a new cause was added to the disorder of the structure, did the severe pains, and the very manifest lameness then in fact come on? And did the mother, as the manner of women is, choose to have it suppos'd, that her disorder had taken its origin from thence; as if by misfortune; rather than that it had existed from the birth?

Certainly no person can readily suppose, that all these changes, and all the changes of that kind which were found by me, had happen'd in the bones of an adult woman, and one who was the mother of two children; especially as he will observe, that the humour which he may suppose to have been deposited there, and to have created ischiadic pains, was not endow'd with such an acrimonious property, as I very evidently knew it to be in another lame woman, who was afflicted with ischiadic pains (*m*): and that from the erosion of the cartilage which cover'd the head of the femur, and from the bloody surface of the acetabulum.

Yet I would wish you to read that history over again if you please, and join it to this, or if you choose rather to those also, wherein I have describ'd

(*l*) Epist. 48. n. 32.

(*m*) Epist. 57. n. 2.

a lameness and an inclination of the uterus at the same time (*n*); as I have in the present.

12. Thus far what I myself saw: now attend to some things which I have lit upon in the mean time by reading; and which have been both seen and remark'd by others, in regard to the disorders of the joints; such as ankylosis, arthritis, and other morbid affections, which are touch'd upon in the observations produc'd, or taken notice of by me just now, or at other times.

Not to refer you to many; turn to that one dissertation which I also commended in the former letter (*o*); I mean, the dissertation of Reimarus (*p*). As to what relates to the ankylosis, he first tells you (*q*) what the celebrated John Hunter saw, at London, in a thigh-bone which had not been long broken; that is to say, the callus, which was interpos'd betwixt the two extremities, was yet soft, and the bony fibres shot from both of these extremities; the small sanguiferous vessels evidently proceeding from the medullium of the bone, and being produc'd within the callus.

And Reimarus observes from hence, that if the crust of bones, which are brought together in order to form a joint, be injur'd, the fibres and vessels may shoot forth on each side, and be join'd with the opposite fibres and vessels, so as to produce that disorder which is call'd the true ankylosis, and is incurable.

But as to that appearance which he saw in the dissection of a boy's knee (*r*); and which was produc'd by a kind of membrane, "such as we generally see generated by inflammation, in the thorax, and in other parts;" connecting the extreme cartilages of the opposite parts; he not only does not doubt but this may be cur'd, but even thinks it may happen, that by a sudden force accidentally applied; as, for instance, in falling, or in the extension or flexion of a rigid joint; a cohesion of this kind may be broken thro': and by this hypothesis he happily explains a certain observation of Meekrenius, which is otherwise not easily to be understood.

And you, perhaps, will think, that certain sudden cures of an adventitious inflexibility of the joints, are to be referr'd to the same class; cures, for instance, that have been brought about by a strong flexion of the subjected limb, being made by the surgeons; or, on the contrary, if the limb cannot be extended of itself, by a strong extension; and that from hence we are to account for the cracking noise which is then heard: that is, from the rupture of a membrane of this kind, which is now pretty firm; and not from the rupture of any other part.

For which reason it were the more to be wish'd, that the signs of an ankylosis, produc'd by this membrane, were known: for if this membrane has true vessels; in the same manner as some of those membranes, whereby the lungs are connected to the pleura; it is natural to suppose, that, within the joint also, as well as in the thorax, some injury had formerly preceded, and that from thence the fibres and vessels might shoot out in the manner we

(*n*) Epist. 48. n. 32. & seqq.

(*q*) § 61.

(*o*) n. 4.

(*r*) §. 45.

(*p*) De Fungo Articul.

have said of the extremities of broken bones; though in the case spoken of at present, the fibres and vessels would be of a membranous nature.

13. But in regard to other diseases of the joints; as I have already sufficiently, though briefly, in that letter wherein I have said this dissertation is commended; pointed out how many various observations occur in the same dissertation; I will here touch only upon those things that relate to a disease, which is, as Reimarus himself acknowledges (s), "singular;" I mean to globules, internally bony, and externally cartilaginous, which I accurately describ'd to you in the fifty-seventh letter (t), as I had found them within the knee of an old woman.

In England, where a disease so rare amongst us, is not unusual; so that the common People call the disorder, "mice in the knee;" he saw, heard, and read, many examples of the same kind.

These bodies are moveable to and fro, through the cavity of that joint, with great freedom; insomuch that in no more than one instance, as far as could be distinguish'd without dissection, "the globular body seem'd to adhere, in a manner, to some one of the ligaments, so that it could not wander through the whole joint."

They may be forc'd accidentally, or by the application of the hand, into those parts of the joint where they can neither be injurious to motion, nor create pains. And in these parts they could, sometimes, be so retain'd, by means of remedies externally applied; and the application of bandages; that they did not even fall out therefrom, after the discontinuation of such assistances.

But the impediment to motion, which others perceiv'd therefrom, or the pain which troubled them whenever they attempted to move the joint, oblig'd them to have recourse to surgeons; who, by cutting into the parietes of the joint, took them out: and this sometimes with good success; but at other times; by reason of the symptoms, which may succeed to such incisions into the cavities of joints, and which this diligent author (u) even observ'd to have follow'd, more than once; with an event truly fatal.

And in regard to the origin of these corpuscles, although he produces two examples, from whence it may seem, that they are little pieces of bones, which have been torn off from the extremities of the bones; by the application of some accidental force; yet as they are seen to be every where "invested with a smooth cartilage," and the disease has not always been preceded by the application of external force; he prudently confesses that nothing certain can be determin'd by him, before the examination of a great number of fresh instances.

I therefore am not sorry, for having written to you, not only what I myself saw formerly, but also what his illustrious preceptor Haller had seen.

For the very learned Reimarus forgets; as is frequently the case; when he asserts that no examples were known to him, of this disorder attacking any other joint but the knee; he forgets, I say, the observation of Haller,

(s) §. 54. & seqq.
(t) n. 14.

(u) §. 26. & seqq.

who found this disease in the articulation of the jaw; and found the cartilages of that joint to be partly consum'd at the same time: some of which I also, at that time, saw to be cut into furrows, and extenuated, and yet not so much as was necessary in order to form many fewer little bodies than I met with; for there were not twenty, as in the observation of Haller, but more; and among these were five of such a magnitude, as to be equal to small grapes: and all of these bodies found by both of us, were in the form of globules; whereas Reimarus speaks only of one, or at most of two, and does not mention any thing of the magnitude, or the figure of them, except that one was "nearly equal to a kind of horse-pea in its bulk."

And it has happen'd to me, in particular, not to find all of them cover'd with a cartilaginous crust, but many of them entirely bony: yet I found none of them loose, but all of them continu'd from the cartilages, or rather from the mucilaginous glands; although I perceiv'd that it might happen, without any great difficulty (*), for some of them to be pull'd away from thence, in the various motions of the knee.

Consider then, whether these things which I have said; not for the sake of repetition, but for the sake of comparison; may be of any use (when join'd to the examples of Reimarus) to help us out in some conjectures upon the origin of this disease; to confirm these conjectures, or, in the mean while, to set them aside.

14. Nor must we omit, on the present occasion, that observation which the same respectable author refers to, as made by him, together with the celebrated Gaubius (†): for it relates to diseases of the joints; and even to that which is nam'd from the joints: I mean, the arthritis, or gout. That is to say, in a man; who, having labour'd under the gout in his feet, had died asthmaic on the going off of this paroxysm; they found here and there, within the lungs, "a white matter, resembling, in some parts of it, a pretty "thick and gypseous nature."

And in reading of this, you will naturally call to mind what I have written to you on the subject of arthritic matter (‡); either when deserting the joints, it falls upon other parts, or, on the other hand, when it is opportunely eliminated from the body; as, for instance, by the intestines; which I have said was seen by Albertini, "in the form of a kind of calx, "or gypsum, lately condens'd together;" or by the urinary passages; a remarkable history of which kind you have, as publish'd by the Royal Academy of Sciences at Paris (a); of a man, that is to say, who having begun to be attack'd, at intervals, by slight arthritic paroxysms, was freed from the much more violent return thereof, as was suppos'd, by the discharge of a milky urine, for about the space of nine months successively; an argillaceous matter subsiding therein, soon after its excretion, and within an hour or two coming to the hardness of a perfect gypsum.

But if it be not discharg'd, and yet cannot fall upon the joints; or at least does not continue to fall thereon; what fatal disorders it brings after it, I have not only already shewn by the example of the most eminent car-

(*) n. 15.

(†) in notula a ad §. 40.

(‡) *Epist.* 57. n. 9.

(a) *Hist. A.* 1747. *Obs. Anat.* 3.

dinal Corneli (*b*), but could also now confirm, by the example of another very eminent cardinal; and even by that of the august emperor Charles the seventh, as spoken of by that celebrated man Jo. Godofr. de Hahn (*c*); if it were not my determination by no means to insist here, upon any other histories of arthritic patients; but to add something upon a far different kind of disease.

Nevertheless, it will not be without its use, for you to compare both the examples given by de Hahn (*c*), with what I have said in regard to the cardinal Corneli; for in the first of them you will find the constitution of body, and at least the suspicion of a calculus in the gall-bladder: in the other there was a calculus of the kidneys; and in both of them you will find some symptoms that relate to the thorax and head, which you may also observe in our case of the cardinal.

15. You will easily remember, that when I sent to you my letter upon the lues venerea; that is, the fifty-eighth letter; I had written the fewer observations therein, because I had before sent many, at different times, in other letters, on occasion of various diseases wherewith that lues was join'd; which observations I particularly referr'd to in that letter (*d*), and at the beginning thereof. To those you will now add others; and especially that, which, in writing of the aphonia (*e*), I did not omit, though it related, at the same time, to disorders brought on the male urethra by a virulent gonorrhœa.

And what disorders have been seen to be produc'd, in the genital parts of women, from that lues, by the celebrated Roederer, you will learn from his dissertation *de Uteri Scirrho* (*f*); which had not as yet come out, when I first wrote; and what mischiefs have occur'd to me therefrom, you will see by this observation of mine, which I had not made at that time of writing.

16. It was certain in regard to a woman of a middle age, that she had been affected with an œdematous swelling of the legs, which had afterwards disappear'd; but by what disease she had been chiefly carried off, was unknown. There was no doubt, however, but she had labour'd under a lues venerea. As this body was dissected by me before the middle of March, in the year 1754; and that in the hospital; in order to examine and demonstrate the natural state, and structure, of some of the parts; I observ'd the following things to be quite contrary to the usual appearances of nature.

The thorax indeed contain'd some water; but the cranium, and the ventricles of the cerebrum, and the cavity of the spine, contain'd more.

In the cavity of the belly, the uterus was found to be very much inclin'd to the left side. And on the side of inclination, I could find no traces of the extremity of the tube, though I enquir'd very attentively. For the tube, as far as I could see, was not hollow, but solid; and had scarcely pass'd to the extent of three fingers breadths from the uterus, when it suddenly terminated there; nor did even the very least mark of injury, of corruption, or cicatrix, appear thereabout, nor in the neighbourhood of that part: so that it seem'd

(*b*) Epist. 57. n. 10.

(*c*) Hist. Podagr. & cæt. ad finem.

(*d*) N. 2.

(*e*) Epist. 63. n. 13.

(*f*) N. 18.

natural to suppose the tube to have been in this state from the original conformation.

On the right side, the tube had its termination at the ovary indeed; but so concreted was it with this part, that neither any of the fimbriæ of it appear'd; nor could the ovarium be brought into view, without cutting away the tube which had grown into one substance with it, and cover'd it; especially as the ovarium was small in this subject.

This body consisted of a whitish substance, which, when cut into, was seen to be internally moist with a whitish humour, and to contain some white globules. While the uterus was taken out of the body, together with the vagina, and the bladder; which was extremely large, and distended with urine; and likewise together with the intestinum rectum; a large and unusual quantity of fat was observ'd to be lying around that intestine: and this was the more remarkable in a woman who was not fat: and at the same time a strong and putridly-smelling ichor, similar, in its appearance, to water wherein fresh meat has been wash'd, was discharg'd from the pudendum and anus.

The internal surface of the fundus uteri, was universally moist with a rosy humour of a yellowish brown, and obsolete colour: and through this surface were seen reddish points, and little lines, which were increas'd by the pressure of the fingers underneath; that is, from the blood being press'd out from the lower part into them. In the cervix and the osculum uteri, there was nothing worthy of remark.

But the vagina, which was, internally, of a pale and brown colour universally, had a foramen of a circular form, in the middle of its posterior paries, somewhat nearer to the lower orifice, than to the osculum uteri: the diameter of this foramen was equal to two fingers breadths; being comprehended within edges of a very black colour, and of a very disagreeable odour. This foramen open'd into the intestinum rectum.

17. In regard to the disorders brought on by poison, whereto related the fifty-ninth letter, I have nothing to add here. For, although the praise which an antidote, found out by that eminent physician, whom I have deservedly commended at other times; I mean John Larber; against both the bite of a viper, and of a mad dog, have since then been brought to me, by no vulgar fame; yet as I am pretty well inform'd that this celebrated man is now writing a dissertation, wherein he relates not only his experiments made upon dogs, by the same antidote, but also gives us very happy instances of cures perform'd thereby, upon human bodies; I choose rather to refer you thereto; that from thence you may fully and distinctly learn every circumstance relative to this remedy; rather than give any few and imperfect hints at present.

You must wait, therefore, till this dissertation shall appear, as I hope it will soon. Farewel.

LETTER the SEVENTIETH

Contains some Things which were promis'd in the latter Part of the Sixty-sixth Letter; and relates to some Disorders of the Belly and Thorax.

1. **Y**OU congratulate me, my friend, upon having finish'd the dissections and lectures of this winter also; and I acknowledge your benevolence, towards me, therein. But I am, at the same time, very sensible what secret view you have in such a gratulation; that is, you intend to put me in mind of the promise I made you, in the latter part of the sixty-sixth letter, that after I had finish'd the business of this anatomical year, I would give some farther remarks upon a subject treated of in that letter.

And indeed you have a right to claim my promise; nor will I suffer you to call upon me again. For I will not only fulfil my engagement, but will go much farther. For I will give you an historical account of the inspection of each body that I have made since the writing of that letter to you, of whatever kind these may be, although one well deserves to be written to you of itself; as by these means you will learn what was the event of our farther enquiries, by dissection, after that uvula.

2. There were, in all, five bodies dissected this winter; at the same time that several experienc'd dissectors, not to mention the students whom I taught anatomy, and who form'd a crowded circle around us, were looking on. The first was dissected in the hospital, before the middle of December in the year 1759.

3. This body was that of a woman who had labour'd under a hernia, and had been carried off by an inflammation of the intestines arising therefrom; and from this they had taken out the greater part of the viscera, in order to select, and prepare, parts from the remainder of the body, proper for the demonstration of the elements of anatomy, as my method of beginning is; so that I examin'd no other part, besides the head and the genitals.

The cerebrum, although it was firm, and even somewhat hard; nevertheless had that very part of the choroid plexusses, within the lateral ventricles; where they are reflected upwards at an angle, to cover the thalami nervorum opticorum; beset, on both sides, with a heap of mucus as it were, of a dirty ash-colour, form'd into the figure of a spheroid, and of the thickness of an inch. But there was no other appearance that deserv'd notice; except a heap of hydatids, which are frequently found to be seated upon that part of the plexusses in particular, though not in such a quantity as here.

In the genital parts there was nothing worthy of observation. I therefore laid open the annex'd urinary bladder, which was contracted into itself, together with the urethra. And on the internal surface, indeed, of the bladder, before it came near to the orifice, we saw two roundish, small, depress'd, somewhat red, and smooth glands, as it were, protuberant; but at the very orifice, or within it, we could see no prominence whatever, not even the most slight.

And that you may conceive, with what attention and diligence I made the enquiry; I did not fail to observe an unusual kind of little line, which, considering the shortness of the urethra, descended for a considerable tract, in a direct and longitudinal course, through the interior and posterior surface of the urethra; and in the middle of its descent became somewhat wider.

Yet this little line did not begin but below the beginning of the urethra; and was so low and depress'd, that it could scarcely be perceiv'd, amongst those blackish blood-vessels, which we frequently see descend through the female urethra in a parallel direction; and whether such a depress'd state, and such a situation, shew it to have any relation to that uvula, which is describ'd to us, you readily perceive, though I am silent upon the subject.

4. The second body which was dissected in the same place, about the beginning of the year 1760, offer'd many things to us that were worthy of observation; for which reason my description will also be longer.

5. A porter, of two-and-fifty years of age, who was much given to drinking, and frequently intoxicated thereby; and who us'd to indulge his appetite for food very much, though not with what was unwholesome; was not only not of a valetudinarian constitution, but so far healthy, that being diligently question'd by his companions, for the reasons you will hear below, nothing else could be learn'd, but that he was wont to complain, every now and then, of a kind of uneasiness, the seat of which he pointed out by laying his hand upon the epigastrium, about the scrobiculus cordis.

This man, therefore, having come three months before into the hospital, on account of a continual tertian fever; began, upon the going off of this fever, to be subject to vomitings, whereby his food was thrown up: and these return'd again, after having intermitted some time, nor went off any more through the whole course of his life.

Therefore, although he never vomited up any thing but what he took down, and these without any ill taste, or smell, except that generous wine which they call *Moschato*; besides which, that was given by way of cordial, he could retain nothing to support him, for the whole last month of his life; yet, for this reason, he was oppress'd with a very great wasting of flesh, and the return of a fever, though now of a slow kind: and in this manner he hasten'd to his end, never having complain'd, in the hospital, of any tumour of the belly, or of pain whatever; nor did his pulse, save a little intermission at some times, shew any thing that was peculiarly disagreeable.

Whatever was internally or externally applied, in order to restrain these vomitings, was without effect.

And indeed quicksilver itself, which had been given about a month before his death, in the quantity of three ounces, at a time when an obstinate costiveness gave some apprehensions of an iliac passion coming on; was
neither

neither of any advantage, nor was seen by any one afterwards, when the glysters which had been thrown up, were return'd; although the attendants suppos'd it to have been discharg'd together with the fœces, some time after, when the intestines began to be a little more relax'd.

Finally, when I examin'd the body after death, I saw it reduc'd to so emaciated a state, that on the back of the hands, and the upper part of the feet, the bones of the metacarpus, and of the metatarsus, could be exceedingly well demonstrated: and the eyes, by reason of the defect of fat in the back-part of their sockets, were sunk inwards to a surprising degree, yet were sound nevertheless; although from the lobe of the left external ear, a slender ring of brass hung down, which is generally a mark of a disorder having formerly preceded in the neighbouring eye. As the mouth happen'd to be open, I observ'd that few teeth remain'd.

These were the appearances externally: but by opening the several cavities, I found such appearances in the belly, the thorax, and the head, as I shall accurately describe; beginning with those of the head.

In dissecting the cerebrum, a small quantity of water was found in the lateral ventricles: and on the plexus choroides, in that very place where, in the body spoken of above, I saw a great number of hydatids, I saw one at least; but this was pretty large, and at first resembled mucus likewise: I then saw the pineal gland to be very small; but this gland had, within it, a corpuscle which, in proportion to the size of the gland, was not very small; being of an irregular figure, hard, not friable, and, in colour, of an obsolete yellow. The spinal marrow; for this part, and all the most considerable nerves, I demonstrated to the pupils, in their situations, according to my usual method; was very lax.

In the thorax, I saw the heart to be without any fat, as I expected it to be; but I found, what I did not expect, particularly in a man who was of a tall stature, rather than otherwise, and who had been always employ'd in a laborious life, and us'd to lift and carry burdens; I found, I say, the heart to be so small, as I never remember to have seen it in adults: for it seem'd to be the heart of a child, and not of a man; being correspondent to this smallness in all its dimensions, and in the thinness of its parietes.

However, besides the veins, which were in a varicose state, in some places, on the surface of the heart, no mark of disease occur'd internally, or externally; nor yet was there any in the valves of the aorta, though the trunk of that vessel seem'd to be dilated.

Before I speak of the belly, I cannot omit here, that the diaphragm, in the right part of its centrum tendineum, or nerveum, as it is call'd, was become bony; or at least, that in this part, betwixt the pleura and peritonæum, was a bony lamina not very thin; consisting of an inch and a half in length, but narrow, particularly in a part near to one of the extremities: the nearer it approaches to the other extremity, the wider it becomes, yet never exceeds the breadth of a man's little finger at the apex; for I have preserv'd it, and had it before my eyes when I wrote this description.

Finally, the belly had scarcely any appearance but what was natural; if you except the intestines, and the stomach in particular.

The intestines were, here and there, distinguish'd with a livid spot: I omit what is the natural consequence of that long-continu'd discharge of the aliments, which I have related; I mean, that they were unusually thin and contracted, and the large intestines as well as the small; though the former were so only for a shorter tract, as they contain'd some excrements, though very few.

But the stomach, being in an unusual situation, of a surprizing length, and inflected in a strange manner, afforded us an uncommon spectacle. For, beginning from whence it generally does (nor was any part of the œsophagus carried down into the belly in this subject) it extended itself through the left side of the belly, in a strait direction, quite to the os pubis, and reflecting itself upwards from thence, and to the right side, it terminated in the intestinum duodenum.

The breadth of this stomach was but small in proportion: nor did it contain any thing else but a kind of thin, and pultice-like mass, as it were, which I suppose was the remains of that small part of the aliments, which had been sometimes retain'd.

You will ask me then, whether I think there was no quicksilver in the stomach; and I answer, that I suppose there was; but that while the stomach was mov'd to one side, it had pass'd into the intestinum duodenum. For in this intestine, which had been previously constring'd, by applying a ligature a little below the pylorus, it was found to the quantity of an ounce and a half: but in the other intestines there was none; as those to whom the care of the enquiry had been committed, reported.

But this was last in order. For having previously perceiv'd a hardness, by handling the seat of the pylorus externally; upon opening the stomach, I saw the ring of the pylorus, divided as it were, into two or three protuberances, not large indeed, but hard.

The part of the stomach nearest to the pylorus, was hard also, for the space of two fingers breadths, the coats being grown very thick in that part, and approaching to the hardness of a bone; yet not being really bony, nor capable of streightening the passage: but, by reason of their inflexible state, they were not sufficiently capable of impelling the aliments into the intestinum duodenum.

Besides these things, and a slight lividness on the internal surface of the stomach; which was extended from those indurated coats for a short space, I observ'd no other morbid appearance in that viscus.

But having before observ'd the bladder in its situation, and found it to be found externally, and to contain no large quantity of urine; and having remark'd some things, which do not belong to this place; I open'd it and found it be equally found within, as the annex'd urethra was also. But we could not see the least sign of a roundish protuberance, at the orifice from whence the urethra begins; that is, we could not see the least appearance of a uvula: but in the place where this ought to have been found, came into sight only that slender little line, which terminated in the feminal caruncle, as it does generally.

6. Although I do not remember to have lit on an ossification of the septum transversum before; yet that very considerable smallness of the heart, and the
seat

seat of the stomach, so different from the natural appearance, struck my mind far more than the other; as I could not readily devise any reason, whereby I could conciliate both of the circumstances with the appearances which had been in the patient, when living, and with those that had been wanting.

For if I had ever seen the heart also, as well as the other muscles, to be diminish'd in its bulk, in an extremely emaciated state of body; I certainly should not enquire, how, before this emaciated state, it had been capable of affording strength to a porter. Did the arteries then, supply what the heart could not?

But how could their parietes be sufficiently urg'd and dilated, by a heart which was not only diminish'd in its flesh, and its muscular strength, but which, by reason of its smallness, had little blood to impel into them; so as to make them restore themselves very strongly soon after, and push on the circulation?

But these difficulties, I readily leave for that ingenuity which you are well known to possess, to determine; as I also do that which relates to the situation of the stomach. For you must either deduce it from the original formation, or from some cause which brought on a prolapsus of the viscus; examples of which kind I have before taken notice of to you (a).

But if you choose to suppose the latter; it is surprising that symptoms should be wanting to indicate this new disease; such as an unusual pain, or tumour; and especially in a man who was by no means a valetudinarian.

And if you suppose it to have existed from the original formation; you see it is no less surprising, not only that there never were, at any time, very manifest symptoms of the stomach being affected; but even that a very great quantity both of wine, and of food, which was continually taken in and digested, and that without being sufficiently reduc'd by mastication, as there were few teeth, had shown in how flourishing a state this viscus was, till at length, after the tertian fever, those vomitings were first brought on.

For that an irregular method of living of this kind, had, at length, so vitiated the pylorus, and the neighbouring part of the stomach, that the motions of the stomach must of course be inverted; rather than the aliments be driven down into the intestinum duodenum; is so far probable, that there is no necessity to account for the vomitings from that situation of the stomach, whether you consider it as congenial, or as new; as they must have existed always, if they had been the consequence of such a congenial situation: and if they had been from a new situation of this kind, they would not have come on, without some tokens of this change which was so recent.

But we must now go on to the appearances observ'd in the third body.

7. A wool-comber, who was a young man, or at least not much more than that, having lain in the hospital three or four days, had departed this life just at the time of beginning the public anatomy of this year 1760. The body was, therefore, brought into the theatre; and every one who look'd at it, suppos'd it to be very proper for dissection, from the smooth skin, and sound appearance which it every where seem'd to have; besides that it was rather of a large stature.

(a) Epist. 39. n. 14. & seqq. & Epist. 65. n. 15.

As the belly had swell'd in a short time, and begun to look green; although I suspected what marks of disease might be latent in the body of a wool-comber, and was soon after well inform'd, by an acquaintance of this man, when living, that he had formerly expectorated blood; yet I began to demonstrate the viscera of the belly in the mean time, till I could light on an opportunity of having a better subject: and about these viscera lay a considerable quantity of water, similar to urine; but scarcely any stench was observ'd, and but a slight lividness of the intestines.

And indeed the omentum was found, though wasted: the spleen was larger than it naturally is, and that in a considerable degree; but was neither hard, nor lax: the coats of the gall-bladder were thick, and the bile contain'd therein somewhat pale; but the liver was found, and of a proper magnitude: the glands of the mesentery were larger than they naturally are; but not hard.

Nor did there appear to be any disorder in the stomach, nor even in the intestines themselves; although they were, as I have said, somewhat livid. For as to the colon descending towards the navel, in almost the middle tract of that transverse arch which lies below the stomach, and being reflected upwards from thence to the left hypochondrium; it seem'd natural to consider that rather as a variety, than as a disease, as this certainly was; though it had never occur'd to me before; I mean, that an artery, of no very slender dimensions, pass'd from the left emulgent, quite to the urinary bladder, in so oblique a direction, that it was inserted into the posterior surface of that viscus, near to the right vesicula seminalis.

But whether the circumstances of there being no flexures in the splenic artery, or of some few sulci being carried through the whole anterior surface of both kidneys, obliquely, and without any certain order; were to be consider'd in the class of varieties only, you yourself will judge: this however is certain, that I found the structure and substance of the kidneys, and of all the other parts which were form'd for the sake of urinary secretion, to be very sound.

Yet neither within the lower part of the urethra, nor within the upper part of the bladder, could I, or any of those many persons who were present, see any thing protuberating, besides that which was spoken of in the last-preceding carcase.

However, we did not go on to demonstrate any other part in this body; for it would have been necessary to pass on to the thorax, which; as I had suspected, and as they, who were willing to examine it slightly before burial, evidently confirm'd; contain'd lungs half rotten, out of which a putrid and strongly smelling matter was effus'd.

8. The fourth and fifth bodies were both of them those of women, who had died in the hospital in the mean time. But from the first, only some of the thoracic and abdominal viscera were brought into the theatre. Let us begin with these.

9. An old woman had died of an ascites.

The substance of the heart was pallid.

The left kidney; though less than the right, and of a surface somewhat

unequal, by reason of a very few furrows, as it were; had nothing internally, however, which differ'd from the usual appearances of nature.

While I was examining these parts, I observ'd that two cæliac arteries arose from the aorta instead of one, though indeed they were very near to each other, and even contiguous; being each of them, however, furnish'd with its proper orifice; and likewise that two spermatic veins return'd from the corpus pampiniforme on the left side, into the emulgent vein of the same side: and that one of those two arteries, and one of these two veins, was less than the other. Yet these were only varieties in nature.

But it was the effect of disease, that, in the fundus uteri, was prominent laterally, a round, white, hard, and middle-siz'd excrescence. At length, opening the urinary bladder, which was perfectly sound, I saw that those two bodies indeed, which descend from the ureters, did not come together at an angle; but by a curv'd body, into which they degenerated, and which was, equally with themselves, thick and prominent: but that any thing was sent from hence to the orifice of the bladder, which was at least at the distance of a finger's breadth therefrom, I could not see; and still less that any roundish protuberance was prominent in the whole of that space, or within the urethra.

10. Another old woman had been carried off by an inflammation of the lungs, and a diarrhæa added thereto. The body of this woman was brought into the theatre, after all the abdominal viscera, except the uterus and the bladder, were taken out.

The thorax being open'd, the inferior lobe of the lungs, on the right side, adher'd closely to the pleura; and this lobe being extremely enlarg'd and heavy, resembled a boil'd liver, when it was cut into. The heart of this woman, who had been but of a moderate stature, was almost as much larger in proportion, as it had been less in the porter (*b*).

Nor yet was it enlarg'd, because the parietes of its cavities were seen to be extenuated and distracted; for these were even of a proper thickness at least, if not thicker than usual; and their columnæ and fasciculi were certainly thicker than usual, as the fasciculi of the auricles also were: so that I was less surpriz'd at a circumstance, which I do not remember to have seen on any other occasion; I mean, that the coronary arteries had orifices which in their diameters exceeded two lines of Bologna, and that the artery which was nearest to the side of one of them, probably one of the membrana adiposa, was not even itself furnish'd with a very small orifice: and in the sinus of the pulmonary vein, besides many small orifices, I observ'd one to lie open, which was scarcely less in its diameter, than that I have taken notice of in the coronary arteries: and by cutting into this orifice, I saw that two or three veins, which brought back blood from the parietes of the sinus, open'd thereinto.

This heart had its ventricles full of polypous concretions. And as I examin'd that part of the great artery which was contain'd in the thorax, I observ'd one place only, where the internal surface of it was not smooth, but prominent internally; and in that part was a bony hardness betwixt the

coats; which however possess'd no greater a quantity of space than the nail of a man's thumb might cover.

This place was on the right side, where the aorta, having now finish'd its curvature, began to descend in a strait line. And, at the same time, a circumstance occur'd to my eyes, which was not unworthy of notice. For amongst the arteries, which come out, two and two, from the posterior paries of the descending aorta, quite to the division of its trunk, it is not rare that instead of two, one only is sometimes dispatch'd.

But here, below the two upper pairs of the lower intercostal arteries, the three next were wanting; one middle orifice occurring three times successively, instead of two: and this not larger than the others, nor immediately divided into two; as generally is the case where there is but one, but even produc'd into a solitary artery, for the space of a finger's breadth at least; that is to say, as far as it had been left adhering to the aorta beneath.

But, on the other hand, the diaphragm (for now that we have begun to speak of varieties, I am not willing to omit this, although it has been frequently both seen and demonstrated by me) instead of one foramen, for transmitting the vena cava into the thorax, had two foramina, divided by a very slender interposition indeed, but by one that was very evident.

Finally, the belly exhibited some remarkable appearances, in those lower parts which had been left in it. Each of the ovaries, and particularly the right, being of a white colour, very much larger than it us'd to be, and of a tuberos texture, was made up of tuberosities, or hydatids, among which were some so distended with water, more than the others, that if you prick'd them pretty deeply, the fluid burst forth with impetus. Yet both of the tubes were entirely free therefrom.

The internal surface of the fundus uteri, was of a red colour inclining to black, by reason of the blood stagnating there in many places; and if, in order to press out this blood, you laid your fingers under the uterus externally, that internal surface was lacerated by reason of its laxity.

This circumstance, and another, that I observ'd in this body, which on account of its singularity ought not to be omitted here; I mean in regard to the two nerves (*c*), into which I had divided the posterior crural nerve by the interposition of the hand only; for when I had cut one of them, which was somewhat larger than its fellow, asunder into two parts, and that in a longitudinal direction, I found a vessel betwixt the fibres thereof, and almost parallel thereto, nor lying far from the axis of the same nerve, full of blood, the diameter of which vessel was almost equal to a line of Bologna; these two circumstances therefore, as I had begun to say, gave me a suspicion that blood would also be found to have stagnated, not only in the vessels of the pelvis, and those that go thereto, but in the bladder also, and the annex'd urethra; and that perhaps in such a quantity as to prevent my usual enquiry.

But when both these last-mention'd parts were laid open, I found the internal coat of the urethra indeed, to be universally of a blackish colour,

from the great number of its small vessels; which were parallel in a longitudinal direction: and the more so, the more it descended to its lower orifice, which was lax, and suffer'd a relax'd little part of the same coat, on the right side, to be prolaps'd outwards, as I have seen in some other women (*d*); yet the upper part of the urethra had nothing besides its colour that prevented our observation, and the bladder not even that.

For it was very sound, and shew'd those two protuberating bodies, which come from the ureters, to be join'd together pretty nearly at an angle; which angle was distant from the orifice of the bladder, by the space of a finger's breadth.

But neither in this interval, nor in that orifice, nor in the neighbouring urethra, did any thing roundish, or even slightly protuberant, offer itself to my eyes, or the eyes of those who attentively inspected those parts with me; and to say all in a word, there was neither trace nor shadow of that uvula.

11. Thus you have the event of this my enquiry, after being repeated in five different bladders, none of which was distended, either with a quantity of urine, or with a quantity of injected air, if you except the third; into which, however, so great a quantity of air had not been introduc'd, as was sufficient to demonstrate its figure to the full extent.

Nor did we dissect any more bodies this winter; but took different parts from different bodies among these, in order to be substituted in the place of those that were less found; and by this means at length, not unsuccessfully, put the finishing stroke to my lectures; in which the whole round of anatomical science is comprehended; for this year also: and it is now the five-and-fortieth year since I undertook the very wearisome office of teaching this part of medical knowledge.

12. As to what remains; if you should wonder, that in this letter I have not preserv'd my usual method; I mean, of making some remark upon almost every history, and even sometimes of making a great number; and, on the other hand, of interspersing, here and there, only very few varieties that I had observ'd in dissecting, and not so frequently; as to the first occasion of your wonder, let me observe, that I did not preserve my method, both because I chose to send you very soon an accomplishment of my promise, and because I had already made a sufficient number of remarks upon most things of this kind in many other letters: and as to the latter occasion of surprize, be assur'd, that I did not do it so much because this letter might otherwise seem to be too short, as because my hope now begins to fail me, of having so long a time yet to live, as would enable me to collect, into a separate work, all the varieties that I have omitted, and many in like manner, to which I every now and then denied a place among the descriptions of morbid parts; that is to say, in some observations of mine, which relate to the anatomy of the same parts, when in a natural state. You will therefore receive both my intentions in good part, according to your benevolence. Farewel.

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- Water therein, I. 4. IV. 26. 28. 30. XVI. 2. 4. 10. 19. XVII. 6. XVIII. 2. XX. 2. 43. XXI. 3. 19. XXIII. 4. 8. XXIV. 18. XXVI. 19. XXVII. 16. XXIX. 6. XXX. 12. XXXVIII. 2. 13. 28. XLVII. 4. 12. 36. XLVIII. 37. XLIX. 10. LIII. 18. LIV. 49. LV. 10. LXIV. 19.
- In great quantity, XXVIII. 6. 10. 12. 16. 20. LIV. 2. 39.
- Water therein limpid, XVII. 25. XX. 2. XXII. 6. 18. XXXVI. 4. 20. XXXVIII. 4. 22.
- Limpid, but having an urinous odour, XLI. 4.
- Water therein like urine, XXXVIII. 15. LXX. 7.
- Yellow, or yellowish, VII. 11. XVII. 10. XXI. 34. XXII. 4. 10. XXIV. 34. XXX. 7. XXXVIII. 34.
- Yellow and bitter, XXXVI. 2.
- Green and yellow, or somewhat green, and foetid, XVI. 30. XXXVI. 25. XXXVIII. 30.
- Brownish and turbid, X. 13. XXII. 22. XXXVIII. 18.

Acrid,

Preternatural APPEARANCES in dead Bodies.

- Acrid, XXVI. 13.
 Salt, and therein pieces and filaments of the omentum, XLVII. 8.
 Of a livid colour, and mixed with pus, XXXIV. 25.
 Of a reddish colour, and mixed with pus, XXXVIII. 52.
 Bloody, or somewhat bloody, V. 19. XIV. 35. XXI. 24. 29. XXVI. 21. XXIX. 6. XXXIX. 26. XLVIII. 44.
 Bloody, and mix'd with fæces, LIV. 37.
 Belly, therein blood extravasated, LIV. 10. LVI. 20. 35.
 Coagulated, LIV. 31.
 Fluid, LIV. 16.
 Fluid, to the quantity of a pound and half, XXXV. 2.
 Of twenty pounds, LI. 40.
 In very great quantity, LIV. 8. LXVII. 17.
 In great quantity, and beginning to be corrupted, LIV. 14.
 Sanious ichor, XXXI. 2.
 Pus, XLII. 25. LIV. 6.
 Sanies, filling the belly, XXXIV. 21. XL. 9.
 A great quantity of the most ill-smelling matter, XXXV. 14.
 A great quantity of fluid and yellowish matter, XXXIV. 9.
 Belly, very offensive smell therein, LIV. 6. 20. 39.
 Gangrenous fætor therein, III. 2. V. 19. XXI. 29. XXXIV. 11. 18. XXXV. 2. 10. 16. XXXIX. 26.
 Belly, viscera of, very fat, LX. 12.
 Rather contracted, and somewhat livid, XXXIX. 2.
 Somewhat green, LII. 4.
 Green and foetid, most of them, LVI. 12.
 The inferior of them blackish, XLI. 10.
 Here and there unequal, with tubercles, XLVII. 14.
 All of them unusually connected to one another, XVII. 17.
 Almost all of those, on the left side, driven towards the right, XL. 26.
 Many of them hanging outwards, within a kind of purse, XLVIII. 48. 52.
 Blackness. See Livor.
 Bladder, full of urine, I. 2. IV. 19. 26. V. 6. VII. 11. XL. 4. XLVII. 12. XLVIII. 34. LII. 30. LX. 12.
 Very much distended with, XXXIX. 33. XLI. 8. 13. XLII. 11. XLIX. 18.
 Enlarg'd, XXXIX. 33. XL. 22. XLI. 13. XLII. 34. 40. LIII. 24. LXIX. 2. 16.
 Connected with the peritonæum, high above the pubes, XXXIX. 33. XLII. 20.
 Extended almost to the navel, IV. 19. V. 6. XXXIX. 33. LVI. 12. LX. 12.
 More oblong than natural, XLII. 11. LXIX. 2.
 Small in proportion, XLIV. 21. LXVI. 6.
 Very much contracted, XLII. 20. 28. XLIII. 24.
 Not of a natural figure, LII. 35. LX. 12.
 Hernia thereof, and a certain sac, VII. 11. XXI. 15. XLII. 28.
 Dilated forwards, at its lower part, XLII. 8.
 With an external pustule, XXXV. 16.
 With an external cicatrix, XXXVIII. 28.
 Beset with a few tubercles, XXII. 18.
 With its external vessels turgid with blood, XLI. 13.
 With the external coat easily separating from the others, XLVI. 10.
 Bladder, coats of, with fleshy fibres, more red than usual, XL. 23.
 Thick, like the fasciculi of fibres in the heart, XL. 4. LXI. 6.
 Thick and hard, IV. 13. 9. X. 13. 19. XIV. 35. XXXIX. 33. XL. 22. XLI. 13. XLII. 15. 20. 28. 30. 40. XLIV. 15. 19. XLVIII. 32. XLIX. 18. LXIII. 13.
 So as to prevent the dilatation of the bladder, XLIII. 24.
 Scirrhus,

I N D E X referring to

- Scirrhus, XXXIX. 33. XLII. 15. 28.
 With cartilaginous concretions, XXII. 4.
- Bladder, internally, as if made of a very fine tomentum, XLII. 13.
 Of an unequal surface, XLVIII. 32.
 With blood-vessels more conspicuous than natural, X. 13. XXIX. 20. XL. 23, 24. XLVII. 12.
- Much crowded at the lower part, XLVII. 34. LXIII. 13.
 And turgid, VII. 11. XLVII. 36. XLVIII. 34.
- With bloody drops appearing under the internal coat, XLVII. 12.
- Somewhat red, and red, XL. 21. 23. XLI. 13.
 At the lower part, XLIII. 24. XLVI. 17.
- Inflam'd, V. 6. XLII. 8. XLVII. 34.
 Blackish universally, or in part, XL. 24. XLI. 10. XLII. 28.
- Gangrenous, XLII. 20.
 Seiz'd with a sphacelus, XLII. 25.
- With a slight abrasion about the ureters, XLII. 2.
- Ulcerated, IV. 19. XLII. 15. 20. 28.
 Wholly from a cancer, LXVI. 2.
- Overflowing with a white and turbid humour, XLIV. 15.
- Purulent, XLII. 40.
 Half full of pus, LXVI. 2.
- Having its fundus perforated, and communicating with an external ulcer, XLII. 20.
- Bladder, having a tubercle at the cervix, XLII. 13.
 A double tubercle, LXX. 3.
- Two scirrhus bodies at the orifice, protruberating internally, XXXIX. 33. See also Prostate.
- Bladder, containing stones, and of what kind, IV. 2. XLII. 8. 13. 28.
- Adhering to the internal coat, XLII. 20. 25.
- Which have been formed about needles or bodkins, XLII. 15. 20. 25. 28.
- Much viscid and bloody mucus about a stone, XLII. 15.
- Bladder, biliary. See Liver.
- Blood, scarcely any in the body after death, XLVII. 8.
- Not much, or in very small quantity, XXVI. 11. XXXVIII. 34. LIV. 46. LVII. 10.
- In the arteries, see arteries.
- Long warm after death, IX. 12.
- With many air-bubbles in it, V. 17. 19. XXIV. 6. XXVII. 2. XXXI. 2. XLIII. 22.
- Blood, filthy, XLIX. 2.
- Thick and viscid, XVI. 14. XVIII. 2.
- Inclining to coagulation, VIII. 23. XVIII. 30. XXI. 19. 45. XLVIII. 37.
- Concreted, VII. 13. XX. 11. XXI. 27. 30. XXXVII. 2.
- Almost universally, XX. 41. XXI. 33. XXX. 7. XXXVIII. 4. 13. LIV. 25.
- Extremely coagulated, XLIX. 14.
- Inclining rather to fluidity than to concretion, XX. 13.
- Without any polypous concretion in any part, LII. 30.
- Fluid, I. 2. III. 24. 26. IV. 2. 8, 9. 11. 24. 26. 35. V. 17. VII. 2. 7. VIII. 4. IX. 12. X. 2. 7. XV. 6. XVI. 4. 10. 19. XIX. 3. 17. 19. XX. 15. 47. 49. XXII. 8. 10. XXIII. 4. XXV. 2. XXVI. 21. 31. XXIX. 8. XXXI. 2. XXXV. 10. XXXVI. 2. 20. XXXVIII. 2. 6. 10. 12. 16. 22. XLIII. 28. XLV. 23. XLIX. 12. LI. 14. LIII. 26. 40. 44. 46. LVI. 17. LXII. 5. LXIV. 5.
- Almost wholly fluid, XXIV. 13. XXVI. 33. XLII. 34. XLVII. 36. LIV. 26. LIX. 3.
- Serous, without fibres, and discolour'd, XLIII. 4.
- Blood, of a dilute red, XXXVIII. 6.
- Of a bright red, LIX. 3.
- Black, V. 6. 19. VIII. 4. 25. IX. 9. 12. 20. X. 17. XVIII. 2. 30. XIX. 49. XX. 16. XXI. 19. 27. 33. 34. 35. 45. 47. 49. XXIII. 6. XXIV. 6. 13. XXVI. 21. 31. 33. XXVII. 2. 8. 12. XXX. 7. XXXV. 10. 12. XXXVII. 4. XXXVIII. 34. XLII. 34. XLIII. 28. XLV. 16.

PRETERNATURAL APPEARANCES in dead Bodies.

16. 23. XLVIII. 15. 37. 38.
 LIV. 37. 44. LV. 10. LVI.
 17. LXIV. 5. 19.
 Black, and resembling fluid pitch or
 tar, IV. 19. VIII. 27.
 Body. See Carcase.
 Bones. See Cranium. Leg. Femur. Fi-
 bula. Frontis. Hyoides. Ilium.
 Innominatum. Occiput. Eye,
 orbit of. Sinciput. Pubes. Tem-
 poris.
 Bones, become flexible and soft, LVIII. 4,
 5.
 Spongy on the surface, carious in the
 medullium, LVIII. 4.
 Such as could be made white by no
 art whatever, XLVIII. 50.
 Brain. See Cerebrum.
 Brachial artery, with bony scales, XLIII.
 17.
 Breast. See Thorax.
 Breast, livid in a certain place, LII. 15.
 Breast, gibbosity of, X. 13.
 Narrowness of, XLVI. 17.
 Water betwixt muscles of, XXXI. 2.
 Breast of a man, having a matter within it
 similar to calx, L. 45.
 Breasts, here and there hard, XXI. 47.
 With a green and black fluid within
 them, *ibid*.
 With a bony body within, L. 41.
 With bodies which degenerate from a
 scirrhus to a cancerous nature,
 and in what manner, L. 48.
 Bronchial glands. See Lungs.
 Bronchial artery, three times wider than
 usual, XXI. 4.
- C
- C**ARCASE, of a violet colour on its
 whole posterior surface, LIX. 12.
 Black, LIX. 3.
 Very black, as if from an universal
 gangrene, LV. 22.
 Of an icteric colour, VII. 11. LI.
 14.
 Soon becoming green in some places,
 LIII. 24. LXV. 8. LXX. 7.
 Fœtid, or ill-smelling. See Fœtor.
 Become three times as large as usual,
 universally, from tumefaction,
 LV. 22.
 Contracted, LI. 3.
 Rigid, LII. 34. See Limbs.
- Carcase, blood from the mouth of, XXI.
 49. XXIII. 2. XXXVIII. 30.
 LII. 34.
 Fœtid water, XLVIII. 44.
 Fœtid matter, LII. 15.
 From the nostrils of, blood, LII. 34.
 From a wound of, an eruption of a
 great quantity of blood, LIII.
 18.
 Carcase, long-continued warmth of, III.
 2. 4. IV. 11. 35. V. 6. VII.
 9. XIX. 17. 19. XXI. 6.
 XXIII. 4. 6. XXVII. 2. XXXIV.
 9. 33. XLII. 34. XLV. 23.
 LII. 30. LIX. 12.
 Carcase, flesh of, soft and flaccid, XLIII.
 4. L. 48.
 Discharging much fluid, when cut
 into, XLIII. 5.
 Cæcum intestine, that is, the appendicula
 vermiformis, very short and not
 at all hollow, LXVII. 11.
 Cæcum intestine of the ancients, surpriz-
 ingly dilated, XXXIV. 27.
 Inflam'd, *ibid*.
 Carotid arteries, tortuous in the neck,
 XXXVII. 30.
 Infected to the form of a screw,
 XLIX. 18.
 Dilated, IV. 19. VIII. 11. XLIII.
 17. 22. LXIV. 13.
 One of them dilated, XXIV. 6.
 XXVI. 21. XXIX. 20.
 Distinguish'd internally with incipient
 ossifications, LXIV. 13.
 And with furrows also, *ibid*. and
 XXVI. 21.
 With bony scales, XLIII. 17.
 LXVII. 14.
 Become bony in part, XXVI. 37.
 LXII. 7.
 One of them become bony in part,
 XXIV. 6.
 Carotid arteries, harder than natural,
 at the basis of the brain, XXV.
 10.
 Having their coats thicken'd, LVI.
 21.
 Cava vena, without blood, LIV. 18.
 Very much distended with blood,
 XIX. 17. XXI. 35. XXXIV.
 15. XXXV. 10.
 Cava vena, superior trunk of, more on the
 left side than usual, LVI. 18. In

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- In the very extremity anteriorly
eroded as it were, LIII. 37.
- Inferior wider than natural, LIV. 37.
- Without blood, XXIX. 20.
- With an oblong and thick polypous
concretion, XLV. 16.
- Cerebrum, none, XLV II 48. 50.
- Not of a natural figure, I. 14. XII.
2.
- Cerebrum, abscess of, V. 2.
- Abscess *sui generis* of, V. 6, 7. IX.
16.
- Cerebrum, arteries of. See Basillary. Car-
otid. Vertebral.
- Cerebrum, arteries of, with bony scales,
IV. 2. 11.
- With firmer coats than usual, VIII.
15. XXIV. 6. XXVII. 2.
- All the vessels of, distended greatly
with blood, III. 26. VII. 7. 13.
VIII. 12. 15. 23. IX. 12. 14.
20. XIV. 5. XXIII. 6. LV.
20.
- With air-bubbles, LIII. 26.
- With polypous concretions, XLV.
21.
- Cerebrum, meninges of, somewhat thicker
than usual in some places, LI. 3.
- With their vessels pretty full of blood,
LXII. 15.
- A little green and livid in some places,
LII. 2, 3.
- Ting'd with the colour of pus, LI.
28.
- Sanious in some places, LI. 3.
- Water beneath them, LII. 2.
- Cerebrum, meninges of, both having their
vessels much dilated with blood,
XLIII. 27. XLIV. 3. LII. 35.
- Having their arteries thicken'd, indu-
rated, and bony in several places,
XXVII. 28.
- Perforated by an erosive humour, IX.
20. XIV. 3. LI. 12.
- Wounded, LI. 45.
- By great bony fragments, LI. 35.
- Chang'd into a more thick and flaccid
nature, IX. 23.
- Cerebrum, dura mater of, acidulated wa-
ter thereabout, I. 6.
- A few drops of water, X. 5.
- A gelatinous concretion, VI. 10.
- A little jelly as it were, LII. 23.
- Something like mucus, LII. 19.
- A thickish ichor, LII. 8.
- A sanies, LI. 5. 7. 34.
- Much sanies, LI. 15.
- A kind of condens'd pus, LI. 14.
- Pus, LII. 4.
- A little purulent matter, LI. 57.
- Purulent matter adhering close to, LI.
49.
- Coagulated blood, LI. 37. 50. LII.
30. 32.
- Adhering very closely, LI. 6. 38.
- A great quantity of blood, LII. 35.
- Cerebrum, dura mater of, fixed more close-
ly than usual to the cranium,
III. 11. XXVII. 2. XXXVII.
30. LXVII. 14.
- More closely than usual in some places,
LII. 38. LXIII. 8.
- Grown into one substance with the
pia mater and cerebrum, I. 14.
IX. 25.
- Having its vessels distended with blood,
VII. 13. VIII. 4. 25. 27.
XXIV. 6.
- More on one side than on the other,
LII. 30.
- And dilated more on one side, LII.
38.
- Somewhat turgid, XIX. 7.
- Artery of, lacerated, LI. 37.
- With its sinuses, distended by a
great quantity of blood, V. 19.
XVIII. 2.
- With air-bubbles also, LIV. 49.
- With polypous concretions, V. 11.
VI. 12. VII. 4. 6. 9. 11. 13.
VIII. 2. 23. XIV. 35. XXIV.
16. LII. 6.
- Sinus, longitudinal, perforated, LI.
54.
- Lateral, on each side ruptur'd, LII.
25.
- The falx thicker and harder than usu-
al, XXVI. 33.
- And a great bone therein, III. 20.
- A small one, XXI. 35.
- Many sharp-pointed bones, XXV.
6.
- Cerebrum, dura mater of, very much cor-
rugated, VII. 9.
- Become thicker than usual, V. 6.
VIII. 15. XLIX. 16. LX.
12.
- In some places, I. 14. LI. 2. 45.
LII. 6. 19. 38.
- Almost bony in some places, I. 10.

Preternatural APPEARANCES in dead Bodies.

- Of a granulated surface as it were, LII. 19.
- Of a cinerinous colour, I. 2.
- Almost in some places, LI. 27.
- Yellowish in some places, LI. 2.
- Somewhat livid here and there, LI. 19.
- Somewhat black, from a fullness of the vessels, III. 11.
- Slightly black, as from contusion, LII. 28.
- Distinguish'd with bloody drops as it were, VII. 15. LII. 6.
- Inflam'd in some places, LI. 39.
- Slightly, LI. 32.
- Slightly injur'd in some places, LI. 17.
- Affected with a sphacelus as it were, LII. 4.
- Eroded with pus, XIV. 5.
- Injur'd by a scale of the depress'd bone, LI. 30. 34. 39.
- By sharp pieces of the fractur'd bone being fix'd into them, LI. 18.
- Cerebrum, dura mater of, under this a piece of pseudomembrana, or false membrane, adhering, LII. 8.**
- Air-bubbles, VIII. 23.
- Water, V. 19. VI. 12. VII. 6. VIII. 11. 15. IX. 2. X. 7. 9. 11. XI. 6. 11. XVI. 36. 40. XXV. 2. XXXVII. 2. LI. 9. 14. 17. 32. LII. 38.
- Limpid water, I. 2. II. 22. IV. 11. 30. VI. 8. XI. 4.
- Mucous serum, LII. 2.
- Gelatinous serum, VII. 6. XI. 2.
- Sanious serum, I. 2.
- A kind of yellow jelly, LII. 15.
- Sanies, LI. 11.
- A puriform matter, I. 12.
- Pus, LI. 2. 17. 27. 28. 30. LII. 6. 19.
- Blood, LII. 34.
- In great quantity, LI. 51. 54.
- Blood at one side of the cerebrum, II. 17. III. 2. 14. 17. 20. IX. 2. 4. X. 13. LX. 4.
- About the cerebellum, II. 21. 22. III. 2. 24.
- At the egress of the spinal marrow, II. 20.
- Cerebrum, pia mater of, thereto adhering externally a little ichor, LII. 8.**
- A little mucus of a yellow and green colour, and very foetid, LII. 10, 11.
- A coagulum of blood, by no means small, LXIX. 2.
- Cerebrum, pia mater of, its vessels turgid with blood, I. 14. III. 2. 6. 11. IV. 13. 16. 19. 21. 24. V. 6. 11. VI. 14. VII. 13. 15. 17. VIII. 4. 25. 27. XI. 11. 22. XIV. 3. 27. 35. XV. 8. XVI. 40. XVIII. 2. XXI. 23. 29. 33. 35. XXIV. 6. XXV. 10. XXVI. 19. 21. 35. XXXVII. 4. XLVII. 12. 33. LI. 35. 42. LII. 6. LIII. 40. LIV. 39. LV. 10. LX. 4. 6. 8. 12. LXII. 5. 7. LXVII. 14. LXIX. 2. 4.**
- Not all of them, V. 15. VII. 9.
- Most on one side, LII. 30.
- On one side only, VII. 11. LX. 2. LXII. 9.
- Turgid with air also, IV. 19. V. 17. 19. VIII. 9.
- With air-bubbles, XLVII. 38. LIII. 26.
- With polypous concretions, VI. 14.
- Some vessels varicous as it were, LI. 15.
- Some arteries dilated, IV. 19. XXXVII. 30.
- Trunk of the carotid lacerated, II. 30.
- A certain artery with a peculiar disorder, III. 6. IV. 19.
- Cerebrum, pia mater of, become thicken'd, LI. 30.**
- Whitish here and there, XI. 13.
- Externally greenish and yellow for a considerable space, XXXVII. 7.
- Inflam'd, VII. 11. 13. LI. 59.
- Slightly inflam'd, VI. 8. LI. 42.
- Perforated, III. 2. 17.
- Easily separable, IV. 4. 16. 24. V. 11. 19. VII. 17. VIII. 12. XI. 11. XXIV. 34. XXVII. 28. XLVII. 33. LI. 30. LXI. 2.
- Cerebrum, pia mater of, within it water, I. 4. II. 17. 22. IV. 2. 6. 7. 16. 19. 24. 26. 30. 35. V. 6. 17. 19. VI. 8. VII. 13. 15. VIII. 6. 9. 11. IX. 3. X. 11. 13. 15. XXI. 23. 24. 29. XXV. 10. XXVII. 2. XXXV. 15.**

I N D E X relating to

16. XLVIII. 38. LI. 42. LII.
 6. 8. LIV. 39.
 Almost limpid, X. 13. XIV. 35.
 Turbid, VII. 2.
 Yellow, VI. 14.
 A little bloody, VII. 9.
 Infipid, or very slightly salt, LIV.
 49.
 In a manner gelatinous, II. 22.
 III. 14. IV. 4. 9. 13. V. 11.
 VI. 2. 12. VII. 2. 11. IX.
 9. X. 7. 17. 19. XI. 2. XV.
 6. XXI. 35. XXXVII. 2. LI.
 6. LXII. 9.
 Air-bubbles, IV. 26. 35. VIII. 9.
 IX. 9. X. 17. XIV. 35. LIV.
 39. 49. LVII. 14.
 Blood, II. 19. III. 4.
 On one side, III. 16. LII. 30.
 Sanies, V. 11.
 Cerebrum, laxer than usual, I. 6. II. 9.
 III. 6. IV. 4. 9. 11. 13. 26.
 35. V. 11. VII. 4. IX. 4.
 23. X. 11. XI. 11. 22. XV.
 6. XVI. 40. XVII. 23. XXI.
 29. 35. XXVI. 21. XXXIV.
 23. XXXVII. 2. 30. XLVII.
 12. 36. XLIX. 16. LI. 9.
 LV. 10. LVII. 10. 14. LIX.
 15.
 Cerebrum, hard, I. 10. V. 6. VIII. 4.
 6. 8. 9. 11. 12. 15. IX. 9.
 X. 17. XXIV. 6. LXI. 2. 5.
 7. LXII. 15.
 Rather dry, VIII. 23.
 Discolour'd, I. 12. IV. 4. 11.
 Not quite of its natural colour,
 XXXVII. 2.
 Somewhat yellow, III. 2. IX. 20.
 Having a somewhat disagreeable smell,
 VII. 9.
 Fœtid and blackish, from a serous collu-
 vies, LI. 12.
 Wounded anteriorly, LI. 59.
 Cerebrum, part of, somewhat pale, LI. 28.
 Somewhat brown, LI. 7. 11.
 Somewhat livid, LI. 27.
 Livid, LI. 14. LII. 2. 3.
 Inclining to a cineritious colour, LI.
 30.
 Being somewhat black, LI. 49. LII.
 10.
 Half putrid, I. 14. IX. 18.
 Deeply corrupted and sanious, LI. 33.
 Hard, IX. 23. 25.

Not of a natural figure, X. 9.
 Considerably affected to some extent,
 both in breadth and depth, LI.
 34.
 Cerebrum, cortex of, somewhat yellow
 and pale, XXV. 10.
 Somewhat black here and there, LII.
 10.
 In a certain place of the colour of pus
 on the surface, LI. 17.
 Corrupted on the surface, in one very
 small place, LI. 3.
 Cerebrum, medullary substance of, softer
 than the cortical, LV. 20.
 Brown, IV. 21. VIII. 9. XXXVII.
 30.
 On one side only, V. 15.
 With small vessels, or bloody drops
 more evident than usual, I. 14.
 III. 6. 14. 26. IV. 21. V.
 19. VII. 13. VIII. 25. X.
 17. XV. 8. XXI. 33. 35.
 XXV. 10. XXVI. 19. XXXIV.
 15. XXXV. 16. XLIV. 3.
 XLV. 16. L. 55. LII. 30.
 LIII. 40. LIV. 39. 44. LV.
 20. LX. 8. LXII. 5. 15.
 Extremely evident, LXIX. 4.
 Cerebrum, one hemisphere of, white and
 green in great part of it, LII.
 23.
 Somewhat eroded, XI. 2.
 More deeply eroded, LI. 44. 45.
 Corrupted in one part, I. 6.
 To the bigness of an apple, LII.
 28.
 The substance almost fluid for a
 certain space, and of a dirty
 blood-colour, LVII. 14.
 With a sinus in the corrupted sub-
 stance, XI. 6.
 With an abscess, V. 2.
 With a very small abscess, containing
 a very thick pus, LI. 19.
 With an abscess *sui generis*, V. 6.
 With a sanious ulcer, LI. 28.
 Internally lacerated and hollowed out
 by the blood, III. 2. 4. 6. 17.
 LX. 2. LXII. 9. 11.
 With a certain large cavity, in which
 was a brown serum and a coagu-
 lated blood, IX. 20.
 With a certain smaller cavity, in
 which was a serum with fila-
 ments, IX. 23.

Preternatural A P P E A R A N C E S in dead Bodies.

- Full of half-dried mucus, III. 6.
- Full of black blood, LXIII. 13.
- Subsiding from the compression of blood upon it, LII. 30.
- Deeply perforated with a wound, LI. 54. 57.
- Deeply lacerated with a wound, LI. 53.
- With a wound in which was coagulated blood, LI. 35.
- In which was a serous colluvies, LI. 44.
- In which was a sanious humour, LI. 45.
- Cerebrum, corpus callosum of, lax, LXII. 15.
- Therein two furrows, VIII. 6.
- The longitudinal tract doubled in a certain place, LXI. 5.
- Cerebrum, ventricles of, therein water, IV. 7. 35. XI. 15. LI. 9. LXIII. 13. LXIX. 16.
- In great quantity, IV. 6. 21. 24. VI. 6. XXXIV. 23. XXXV. 6. LIV. 49.
- In little quantity, IV. 9. 13. VI. 2. 10. VII. 7. XLVIII. 38. XLI. 6. 27. 28. 38. 45. LIV. 29. LXI. 2.
- None, VIII. 9.
- A great quantity and somewhat salt, II. 20.
- A great quantity and limpid, XXXVII. 30.
- A little and pretty thick, IV. 8.
- Yellow, VI. 14. VII. 27.
- Somewhat red, XLVII. 12.
- In all of them blood, III. 11. LII. 34. LX. 4.
- Almost in all coagulated blood, LI. 59.
- Cerebrum, lateral ventricles of, shorter than they ought to be, X. 17.
- Therein water, I. 4. III. 14. 24. IV. 16. 19. V. 11. 15. VIII. 2. 11. IX. 2. 3. 19. X. 11. XI. 13. XIV. 3. 27. XVI. 36. XX. 5. XXIV. 6. 16. XXVII. 2. XXXI. 5. XL. 2. XLIII. 4. LXIX. 8. LXX. 5.
- Limpid, I. 10. III. 26. V. 6. IX. 12. XIV. 35. XV. 6. XXV. 10. XXIX. 12. LIII. 40. LV. 20. LXIX. 10.
- In great quantity, XXV. 4. 10. XLVIII. 15.
- In small quantity, LX. 10. 12. LXII. 9.
- Limpid and in great quantity, LXII. 15.
- A large quantity and somewhat turbid, LII. 35.
- The same in small quantity, XLII. 11. XLIV. 7. LII. 20.
- In great quantity and turbid, VIII. 4. XII. 2. XXI. 33. XXVI. 19. XXXVIII. 34.
- And of the colour of urine, XXVI. 33.
- Yellow, IX. 9.
- Yellowish, XLV. 16.
- Brownish and in large quantity, I. 14.
- Of a yellow and red colour, and in great quantity, VIII. 15.
- Reddish, VIII. 25. IX. 4. 16. XXI. 23. 29. XXXV. 16. LII. 6. 9. 10. LXII. 5. LXIII. 8.
- Bloody, III. 4. IV. 26. VI. 8. 12. VII. 9. 13. XI. 11. XVI. 10. XXVI. 35. XLIV. 3. LII. 23. LX. 2. 8. LXII. 7.
- Frozen by the cold, XIII. 15.
- Salt, IV. 2. 4.
- Blood, II. 19. 20. III. 2. 16. 17.
- A great quantity of, II. 13.
- Purulent matter, V. 2.
- Cerebrum, lateral ventricles of, in one of them a follicle fill'd with a great quantity of water, I. 6.
- Limpid water, IX. 20. XI. 4.
- Bloody water, LX. 6.
- Æruginous water, XI. 4.
- Very acrid and biting, LI. 53.
- Water with grumous blood, LI. 54. LX. 6.
- Salt water, X. 2.
- Concreted by the frost, LXVII. 14.
- Blood, II. 9. 11. 15. 22. III. 6. 11. 16. 17.
- In considerable quantity, LXII. 7.
- In so great a quantity as to dilate the ventricle, LII. 23. LXVII. 14.
- Pus, V. 4. XIV. 5.
- Cerebrum, lateral ventricles of, their surface of a brownish colour, I. 14. V. 6.

I N D E X referring to

- Vessels distended with blood, III. 14. V. 11. VIII. 4. X. 19. XXVII. 30. XLV. 16. XLVII. 12. LII. 30. LIII. 40. LX. 12. LXII. 15.
- Membrane through which they creep easily separable, XLVII. 12.
- Their septum lucidum, with the vessels running through the sides, very much distended with blood, LIV. 39.
- More lax than usual, XIV 35. LXIII. 8.
- Having water within its duplication, IV. 19. VIII. 11. LXIII. 8.
- Ruptur'd, III. 2. 4. 17. V. 15. XIV. 3. XXV. 10. LX. 4. LXII. 7. LXVII. 14.
- Fornix in them, very lax, VIII. 12. IX. 10. XIV. 3. 35. XXI. 33. XXV. 10. LXII. 5. LXIII. 8.
- Consum'd, LX. 4. LXII. 15.
- Cerebrum, lateral ventricles of, therein the plexus choroides discolour'd, I. 10. III. 2. 6. IV. 16. 21. V. 11. 15. IX. 9. X. 11. XII. 2. XIV. 35. XXI. 19. XXVI. 33. XXIX. 12. XXXV. 6. XXXVII. 30. XXXVIII. 34. XLII. 11. XLIV. 7. XLVII. 12. LII. 10. 30. LX. 2. LXI. 2.
- One of them, IX. 20. LXII. 7. LXIII. 13.
- Somewhat-pale, but blackish in the middle, XXV. 10.
- Fuller of blood than usual, III. 14. VIII. 23. X. 17. XXI. 35. LII. 38. LX. 10. 12.
- In a manner inflam'd, II. 19.
- Of a somewhat black colour degenerating into red, LIII. 40. LIV. 44.
- One of them very much injur'd, LXII. 7.
- Lacerated, II. 9. 11. 13. 15.
- Both consum'd, LX. 4.
- Very lax, IX. 9.
- Connected more firmly than usual with the subjected optic thalami, LXI. 2.
- One of them varicous, VII. 4.
- In them vesicles full of water, I. 10. III. 14. IV. 11. 16. 19. 26. 35. V. 6. 19. VI. 12. VII. 11. 13. 15. IX. 2. 3. X. 11. XI. 13. XX. 5. XXI. 23. 29. 33. XXIV. 16. XXXV. 16. LV. 10. LX. 8. LXII. 7. LXIII. 13. LXX. 3. 5.
- Very large, III. 11. IV. 2. VIII. 4. XXV. 10.
- A body consisting of hydatids, XI. 6.
- Many small red bodies, in a manner glandular, LXII. 5.
- Glands larger than natural, II. 22. IV. 24. VIII. 2.
- Very tumid, XXIV. 4. XXXIV. 23.
- Cerebrum, lateral ventricles of, their parietes not so smooth as usual, XI. 11.
- Eroded or burst through, II. 9. 11. 13. 15. 16. III. 2. 4. 6. 16. 17. LX. 4.
- In one of them a sordid ulcer, LI. 54.
- An ulcerous cavity, XI. 4.
- Their cavity enlarg'd, LX. 4.
- In one. See above in one of them Blood.
- Cerebrum, third ventricle apparently shorter than usual, LXII. 15.
- With its upper fissure constricted, LXI. 2.
- With its sides scarcely to be distinguish'd, LX. 4.
- Therein water, III. 24. VI. 4. XI. 22.
- Much, but not turbid, XXV. 10. LXII. 15.
- Bloody, LXII. 7.
- Blood, III. 6.
- Pituitary gland subjected to it, of a yellow and brown colour, XII. 2.
- With mucus within, IV. 19.
- Contracted and subsiding, III. 6. IV. 26. 35. IX. 20. XII. 2. XXXVII. 30. LVII. 14.
- In part consum'd, IV. 19. XII. 2. XXV. 10.
- Cerebrum, the fourth ventricle of, as it is call'd, longer than the natural, LXII. 15.
- Cerebrum, medulla oblongata of, laxer than usual, XII. 2. XIV. 35. XXI. 33. XLVII. 12. LV. 10. LIX. 15. LXII. 5.

PRETERNATURAL APPEARANCES in dead Bodies.

- Between that and the pia mater, water, XLVII. 12.
 The crura thereof beset with round corpuscles, II. 20.
 The corpora striata of the ventricles having medullary points instead of striæ, XII. 2.
 One of these bodies more protuberating than the other, IX. 9.
 More deepens'd, IX. 20. XI. 11.
 Of a dirty brown colour, IX. 20.
 Of a yellow colour, and almost fluid, XI. 11.
 With a red tubercle, *ibid.*
 Separated from the brain, XI. 2.
 Lacerated by blood, or by pus, III. 4. V. 2. LXII. 7.
 More lax than usual, LXII. 5.
 Consum'd, LX. 4.
 Lacerated by blood, LXII. 7.
 Cerebrum, medulla oblongata of, nates and testes of, somewhat yellow, XI. 11.
 Lacerated, LX. 4.
 Pincal gland lying thereon of a brown colour, and slightly yellow, VIII. 12.
 Of a rosy colour, X. 17.
 Thin and strigose, VIII. 12. LXIX. 10. LXX. 5.
 Very lax, VIII. 12. XXXVII. 30. LIV. 39.
 Tumid, X. 17. XXXVII. 30.
 Tumid with limpid water, LXII. 15.
 With turbid water, and yellowish matter, XXI. 24.
 Larger than usual, with longer radicles, and more of a mucous nature, LXI. 2.
 Larger, laxer, and more globose than usual, LIX. 15.
 Larger, firmer, and whiter, with some loculi, as it were, within, I. 14.
 More firm, globular, and white, XXIX. 12.
 Wholly consisting of a hardish matter, XI. 11.
 Containing little pieces of hardish matter, V. 11. VI. 12. X. 17. LXX. 5.
 Having a kind of yellow sandy particles adhering to it, I. 10. III. 14. VII. 15. VIII. 6. 9. 15. XIV. 35.
 Cerebrum, medulla oblongata of, its nerves flaccid, V. 2. XIV. 35.
 About some pairs of them a sanies, LI. 33.
 Cerebellum, somewhat pale, VI. 12.
 Cortex of, somewhat pale and yellowish, XXV. 10.
 Pretty lax in its substance, III. 6. 24. V. 11. VII. 9. 15. VIII. 4. 9. 11. 15. XII. 2. XV. 8. XXI. 20. XXV. 10. XXVI. 21. XXVII. 2. XXXVII. 30. XLII. 11. XLVII. 12. LII. 8. LIV. 39. 49. LV. 10. LIX. 15. LXII. 7. 9.
 More firm than usual, LXI. 2. 7.
 Half rotten in some places, II. 22. XIV. 3.
 Having small vessels and bloody points more evident than usual internally, V. 19. LII. 30.
 Having blood effus'd internally, II. 22.
 Within one lobe only, LX. 6.
 Cerebellum, substance of, grown into one body with both the meninges in some places, I. 14.
 With the pia mater, LXII. 15.
 Somewhat injur'd from a blow, LII. 25.
 Scirrhus in more than one half of it, LXII. 15.
 In the remaining part, with an unusual disposition of both substances, *ibid.*
 Chest. See Thorax.
 Clavicle, fractur'd, LII. 35.
 Clavicles, part of, consum'd by an aneurism, XXVI. 9.
 Part of one, XVII. 25.
 Broken and eroded, XVIII. 25.
 Clitoris, glans of, entirely shut up under the skin of the pudendum from the original formation, XLVI. 20.
 Cœliac artery, with bony scales internally, XL. 24.
 Ulcerated here and there internally, *ibid.*
 Cœliac, branches of. See Splenic, Stomach.
 Colon intestine, less frequent situation of, IV. 16. 26. 30. XVI. 8. 9. XVII. 25. XIX. 19. XX. 16. XXI. 33. 35. 47. XXIX. 12. XXXIV. 2, & seq. XLIII. 22. XLVIII.

- XLVIII. 38. LII. 2. LVII. 2.
 LIX. 12. LXII. 5. 7. LXX. 7.
 Narrowness and contraction of, III.
 2. IV. 16. 35. XVIII. 2.
 XXIV. 34. XXIX. 12. XLVIII.
 37. 38. 55. LIV. 39. 46. LV.
 10. LXII. 7.
 Distention of with air, XX. 16.
 XXI. 19. 30. 33. 35. 36. XLIII.
 22. LII. 2. LV. 10. 11.
 Few cells of, III. 2.
 Convolutions of, very large at its ter-
 mination, *ibid*.
 Beset with sebaceous tubercles,
 LXVIII. 12.
 Livid, LII. 12.
 Inflam'd so as to be almost black,
 XXXV. 8.
 Part of, green, XXXIV. 15.
 Pinguedinous appendages of, some-
 what livid, LV. 11.
 Coalition of, in a certain place,
 XXXIX. 29.
 Paries of, not the whole tube, in-
 tercepted within a hernia, and
 blackish, XXXIV. 15.
 Beginning of, very red, XXXV.
 10.
 Of a bright red degenerating into
 brown, LIV. 39.
 Affected with a gangrene, XXXI.
 2. XXXIV. 25.
 Ulcerated, XXXI. 2.
 Colon, wound of, LIV. 20. 37.
 On the surface, LIV. 35.
 Conception, false. See *Mola*.
 Cranium, integuments of, having a great
 blackness from contusion, LVII.
 14.
 Colour of a little chang'd in some
 places, LII. 11.
 Cranium, ill conformation of, I. 14. XII.
 2. LIII. 26. LXII. 15.
 Narrower than it ought to be, III. 6.
 In respect of the cerebrum, LI. 30.
 More capacious than it ought to be
 in the same respect, LI. 9.
 Thicker than usual, III. 2. IV. 16.
 XIV. 35. XXVII. 2. LX. 12.
 Thinner than usual, IX. 20.
 Hollow'd out internally with deeper
 cavities than usual, LXIII. 8.
 In some places consisting of a very
 thin lamella, *ibid*.
 Having the sulci for receiving the
 vessels larger and deeper on one
 side than on the other, LII. 38.
 With the seat of the sutures pellucid,
 IX. 9.
 Some sutures of the, laxated, LI. 19.
 25. 26. 27. 28. LII. 28.
 Become soft, LVIII. 4. 5.
 On internal surface of a red colour
 degenerating into black, I. 12.
 14.
 Protuberating in several places, as
 if from a new accession of bony
 matter, XXVII. 2.
 An acute prominence, LII. 11.
 Cranium fissur'd, LI. 42. 44.
 With a very long fissure, LII. 35.
 In both sides, LI. 34.
 With two fissures, one of which was
 very long, LII. 28.
 Perforated, IX. 20. 23.
 Depress'd in some places, an acute
 lamina being prominent inter-
 nally, LI. 34.
 Fractur'd, LI. 38. LII. 28.
 Broken into fragments, LIII. 37.
 Fractur'd transversely thro' the whole
 basis, LII. 25.
 Cranium, both the ossa petrosa of, unequal
 on their surfaces, LV. 10.
 One of them perforated by a caries,
 XIV. 3. 5.
 Os ethmoides of, eroded, and there-
 fore quite pervious, I. 6.
 The other bones thereof. See under
 their proper heads.
 Cranium, acid odour within, XXI. 29.
 All the vessels within distended with
 blood, LX. 10.
 Water within, III. 14. IV. 4. 13.
 19. 28. 35. V. 6. VI. 6. VII.
 4. 9. X. 17. 19. XI. 2. 13.
 XVII. 23. XXI. 7. 33. XXIV.
 6. XXV. 10. XXXI. 2.
 XXXIV. 23. XXXV. 16. LVII.
 10. LXIX. 8. 16.
 In small quantity, XX. 16. LI.
 19. 20.
 Of a pretty thick nature, IV. 9.
 Bloody, LXIX. 15.
 Blood extravasated therein, IX. 25.
 XI. 2. XXVI. 17. LII. 25.
 In very small quantity, LI. 25.
 Pus therein, XIV. 3. 5.
 Cranium, bony fragments within it from
 a blow, LI. 59.

PRETERNATURAL APPEARANCES in dead Bodies.

Crural arteries, hard and rigid, LX. 12.
 Crural artery, large aneurism of, in the upper part of the thigh, L. 11.
 Large aneurism of in the ham, L. 55.
 Transverse incision of, with its associated vein, above the ham, LIV. 46.
 Crural vein, one narrower by a third-part than the other, LVI. 10.
 Cutis, very hard, XLIX. 16.
 Cutis, much water under it universally, XXXVIII. 6.
 A small quantity, XXX. 12.

Scirrhus, XXX. 12.
 Livid, from inflammation, XXXIV. 9.
 Of a black colour, XXX. 12. 16.
 Duodenum, internally red, as if from inflammation, XXX. 7.
 With erosions, LIX. 3.
 With gangrenous erosions, XXIX. 20.
 With the traces of an old erosion, XLIV. 21.
 Containing a green humour, LIX. 12.
 Drum of ear. See Tympanum.

D

Diaphragm, driven very high up into the thorax, XXXVIII. 34.
 Depress'd on the right side, XVI. 26. XXVI. 11.
 On the left side, XLV. 16.
 Falling downwards on both sides, XXVI. 21.
 Diaphragm, somewhat green colour of, LII. 4.
 Lower membrane distinguish'd with black spots, XXXV. 2.
 All the small vessels of, conspicuous by reason of their fullness, X. 13.
 Substance of, chang'd on the right side, XVI. 26.
 Center of, ting'd on both sides with a bilious spot, XXX. 20.
 In part bony, LXX. 5.
 Of an unusual figure and smallness, LX. 5.
 Foramen of, for vena cava, very large, LIV. 37.
 For oesophagus, much larger than usual, XXXVII. 30.
 Diaphragm, inflammation of, VII. 13. VIII. 25. XXI. 35. LIII. 5.
 Inflam'd, as it were, XXI. 36.
 Perforation of by an abscess of the liver, XXXVI. 4.
 By a subjected aneurism, XL. 29.
 Wound of, LIII. 3. 5. LIV. 10.
 Double, LIII. 40.
 Duodenum intestine, longer than usual on the right side, XLVIII. 38.
 Much wider than usual, *ibid.*
 Near to the stomach, hard and thick, XXXIX. 26.

E

EAR, bony meatus of, broken, LII. 25.
 Perforated by a caries, XIV. 3.
 Membrana tympani of, ting'd with blood, XIX. 8.
 Injur'd, XIV. 5.
 Ruptur'd, LII. 25. 30.
 Tympanum of, blood in its cavity, *ibid.*
 Sanious matter, VI. 4. XIV. 5.
 A purulent matter, as it were, XXI. 24.
 Emphysema, beginning of about a wound of the abdomen, LIV. 37.
 Enterocoele, sacculus of. See Hernia.
 Epiplocele, sacculus of. See Hernia.
 Excrescences. See Adipose Membrane.
 Eye, externally putrescent, LI. 7.
 Less than the other, LXIII. 6.
 Become less, and of the figure of a low cone, LII. 30.
 Not sufficiently spherical in its figure, LXIII. 2.
 Eye, cornea of, become less, LII. 30. LXIII. 6.
 Not natural in its figure, LII. 30.
 Opaque, XIII. 17. LII. 30. LXIII. 2. 4.
 Internally unequal, LXIII. 2.
 Having a small cavity hollow'd out, XIII. 17.
 Uvea of, not entire; LII. 30.
 Iris of, adhering to the cornea, XIII. 17. LXIII. 2.
 Pupils of, unequal, LXIII. 10.
 Choroides of, very closely adhering to the sclerotics, LXIII. 2.
 Retina

Retina of, having a bloody colour,
XIX. 8.

Being in a very bad state, LXIII.

4.

Become bony, LII. 30.

Another ossification within the eye,
XIII. 9.

Eye, aqueous humour of, somewhat black,
chrySTALLINE, and vitreous none,
LII. 30.

ChrySTALLINE humour of, adhering to
the cornea, XIII. 17. LXIII. 4.

Less thick than it ought to be,
XIII. 15. LXIII. 6. 10.

Much diminish'd, XIII. 17.

Unequally hollow'd out anteriorly,
LXIII. 2.

Imperfect at the side, XIII. 15.

Scarcely a fourth part of it re-
maining, LXIII. 4.

Anteriorly white, and whitish in
other parts, LXIII. 6.

White and opaque, XIII. 17.

Somewhat opaque, LXIII. 10.

Made up of two substances, white
and brown, XIII. 15.

Of a dirty yellow colour inter-
nally, *ibid.*

Containing a series of black par-
ticles internally, LXIII. 6.

Containing more than natural of
the aqueous humour, *ibid.*

Softer than it ought to be, XIII.
15.

Hard, and humid, LXIII. 10.

Hard, and dry, *ibid.*

Eye, vitreous humour of, in great measure
converted into water, LXIII. 6.

Like a tough pituita, XIII. 15.

In a very bad state, LXIII. 4.

Eye, blind, state of, XIII. 8, 9. LII. 30.
LXIII. 2. 4. 6. 10.

Eye, optic nerve of. See Nerve.

Eye, coalition of its trochlearis muscle
with the trochlea, LXVII. 9.

Eye, fornix or arch of its orbit, slightly
crooked, LI. 7.

A little livid, XXVI. 31.

Livid, XVIII. 25. XIX. 3. 5. 7.

XXI. 9. XXIV. 13. XXV. 2.

XXVI. 35.

Black, and soon after pale, XLII.
34.

Like that of a suffocated person,
LIII. 26.

Face of a carcase, somewhat tumid, XXVI.
33.

Turgid, XVIII. 25. XXV. 2.

Become disfigur'd, LIV. 20.

Face, muscles of, all of a bright red co-
lour degenerating into brown,
LII. 30.

Fat, very tenacious in some places, LXIX.
2.

Fat, colour of, brown, III. 26.

Globe of fat under the skin at the
ensiform cartilage, of the bigness
of a fist, XIX. 58.

Femur, both bones of, curv'd anteriorly,
LXIX. 10.

One more curv'd and thicker than is
natural, LX. 6.

Turn'd to the external side, *ibid.*

Head of, not entire, pull'd away and
left within the acetabulum, LVI.
10.

Pull'd away entire and left there,
LVI. 9.

Conic and longer than usual,
LXIX. 10.

Made almost flat, and rather larger
than usual, LVI. 12.

Depress'd, diminish'd, not smooth,
LVI. 14.

Not round, but depress'd, and un-
equal, LVII. 2.

Less broad than usual at its lower
part, LX. 6.

Without a ligament, and in an
acetabulum not natural, LVI.
12. 14.

Head of, having its cartilage con-
tus'd, as it were, LVI. 18.

Lurid, brown, and in some places
red, LXIX. 20.

Lurid, not smooth, and in part
deficient, LVII. 2.

With its marrow almost watry,
LXIX. 10.

Head of, with its round ligament re-
lax'd, and luxated from thence,
LVI. 7.

F

FACE of carcase, rosy colour of,
XIV. 3.

Somewhat red, XXVI. 33.

Red and livid, XXI. 30.

Preternatural APPEARANCES in dead Bodies.

Less thick and firm than usual,
 LVI. 17.
 Flaccid, LXIX. 10.
 Ting'd with a pale red, LVI. 17.
 Head of, with its cervix thicken'd,
 LX. 6.
 Apparently shorter on one side than
 the other, LVI. 20, 21.
 Broken, LVI. 9.
 Consum'd, LVI. 10.
 Femur, trochanter larger of, thicken'd,
 LX. 6.
 Femur, exostosis of near its lower heads,
 and the cells of that exostosis
 overflowing with a liquid and
 yellow oil, L. 60.
 Femur, lower heads of, eroded, L. 55.
 One of them longer than it ought to
 be, LVI. 26.
 With its cartilaginous crust exte-
 nuated, LVII. 14.
 Fibula, upper part of, eroded, L. 55.
 Fingers, a tartareous matter at their joints,
 XL. 2.
 Fætor of carcase, more disagreeable than
 usual, VIII. 23. XVII. 23.
 XVIII. 34. XIX. 20. XXIV.
 11. XXVII. 2. XLIII. 27. LI.
 57. LII. 2. 15. LIV. 20. LXV.
 8.
 Such as proceeds from acid matter,
 XXV. 16.
 Dead, XX. 9. XLVIII. 5. 7. 9. 18.
 Head and neck of, black as if from
 contusion, XLVIII. 9.
 With its head compress'd, as it were,
 on the sides, XLVIII. 5.
 With its viscera bloodless, *ibid.*
 Placenta of, with large blackish globes,
 as it were, beneath, *ibid.*
 Containing a white body, XLVIII.
 23.
 Very much extenuated, XLVIII.
 18.
 Navel-string of, very slender, XLVIII.
 5. 18.
 Foot, subcutaneous gland of, L. 15.
 Forehead, bone of. See *Frontis os*.
 Frontis os, somewhat rough externally,
 LI. 14.
 Injur'd externally, LI. 15.
 With an external chink, LII. 23.
 With external chinks and a cavity,
 LI. 12.
 Fissur'd, LI. 17. 39. LII. 32.

Throughout with a part of the
 sphenoid, LII. 34.
 Depress'd, LI. 30.
 With an unequal scale protube-
 rating inwards, *ibid.* & 33. 39.
 Broken asunder, LI. 39.
 In the orbit of the eye, LI. 37.
 Perforated in the orbit of the eye,
 LI. 57.

G

GALL-bladder. See Liver.
 Glands. See *Aspera arteria*, Axil-
 lary, Inguinal, Jugular, Maxil-
 lary, Mesenteric, Parotid, Pi-
 neal, Pituitary, Prostate, Sali-
 vary, Thymus, Thyroid, Ton-
 sil.
 Glands of Cowper. See Urethra.
 Mucilaginous. See Knee.
 Glands, most of them diseas'd, XXIX.
 12.
 Gummata. See Tumours.

H

HANDS, a certain muscle of, very
 slender and tendinous, on the
 right side, but not so on the left,
 LX. 6.
 Fingers of, contracted and rigid,
 XXVII. 2.
 Very rigid, LXII. 5.
 Hand, palm of, with some tendons,
 muscles, and nerves wounded
 and injur'd, LIV. 44.
 Heart, double, XLVIII. 57.
 Differing from its usual form, XVII.
 12. LX. 8.
 Plac'd lower and more to the left side
 than usual, XVII. 25.
 Heart, large, III. 26. IV. 2. 16. V. 19.
 XVI. 6. XVII. 23. 25. XVIII.
 2. 34. XX. 35. XXI. 30.
 XXIII. 4. XXVI. 15. 31.
 XXVII. 28. XXXVII. 30.
 XLII. 34. XLIII. 17. 22.
 XLIV. 3. 19. XLV. 16. LIV.
 37. LXIV. 5. 19. LXVI. 9.
 LXX. 10.
 Very large, XVII. 6. 8. 21. XVIII.
 6. 14. 28. 30. XXI. 49. XXIV.
 13.

I N D E X referring to

13. XXVII. 12. XXXVIII.
 12. XL. 23. LIII. 9. LVI.
 17.
 Small, XXVI. 17. LX. 8.
 Very small, XXVII. 12. XXX. 10.
 L. 4. LXX. 5.
 Heart, very fat, III. 20. XVI. 36.
 XXVII. 2. XXXV. 18. XLIII.
 17. LII. 34.
 Almost universally cover'd with a
 thick and hard fat, LXV. 7.
 With a fat partly unequal, and of a
 brown colour mix'd with red,
 XLV. 23.
 With a little fat, XIV. 35.
 Entirely destitute of fat, XLIX. 18.
 LXX. 5.
 Cover'd with miliary granules, as it
 were, XLIX. 4.
 With white concretions in several
 parts, XX. 36. 51.
 And having an appearance of ero-
 sion, XXI. 2. XLIII. 17.
 With a kind of puriform matter,
 XLIII. 17.
 With a polypous pseudo-mem-
 brana, XLV. 16.
 With a certain reticular body,
 XX. 20.
 Heart, surface of, lurid and unequal,
 XLIX. 18.
 Unequal, and in a manner cor-
 roded, LIII. 29.
 Slightly eroded, XVI. 17. 43.
 With a pretty large bony scale,
 XXVII. 16.
 With vessels distended with blood,
 and almost varicous, III. 26.
 XVIII. 2. 30. XIX. 49. XXI.
 35. 49. XXXVI. 23. LX. 4.
 LXX. 5.
 With varicous vessels, XXXVIII.
 10.
 With a kind of ruptur'd hydatid,
 III. 26.
 With a large hydatid pendulous
 from its apex, XXV. 15.
 With a cystic tumour, XXI.
 4.
 With the apex slightly inflam'd,
 XVI. 40.
 Heart, somewhat green, LII. 4.
 With its membrane become thicken'd,
 XXIV. 2.
 Eroded, XXXVIII. 10.
 Heart, wholly or partly adhering to the
 pericardium. See Pericardium.
 Heart, flaccid, IV. 4. 26. V. 11. 19. X.
 11. XI. 11. XVIII. 14. XXI.
 30. XXVII. 16. XXXIV. 18.
 XXXV. 16. LH. 2. LVI. 26.
 LVIII. 13. LX. 4.
 Very flaccid, XI. 13. XXI. 49.
 XXX. 14. XXXI. 2. XLVIII.
 44. LIII. 29.
 Very hard, XXVI. 11. 31.
 Contracted into itself, XXVI. 11.
 Heart, substance of, pallid, LXX. 9.
 Universally of a cineritious colour
 degenerating into lividness,
 XXV. 10.
 Having a pretty large bony sub-
 stance within it, XXVII. 2.
 Parietes of, thick, XLIV. 19.
 Heart, ventricles of, chang'd one into the
 other, as it were, XVII. 12.
 Dilated, XVIII. 28. 30. 34. XXI.
 34. 49. XXIII. 6. XL. 23.
 LVI. 17. LXIV. 5. 12.
 Full of black and grumous blood,
 XXX. 7.
 Coagulated blood, XXII. 16.
 XLVIII. 15. XLIX. 2.
 Polypous concretions, LXX. 10.
 Containing a little frothy and fluid
 blood, LI. 50.
 Pretty thick blood, VI. 8.
 Scarcely any blood, XXVI. 35.
 LIII. 33.
 No blood, XXII. 4. XXVI. 13.
 17. XXIX. 18. LIX. 12.
 Heart, right ventricle of, dilated, XVIII.
 6. XXV. 2.
 With its parietes extenuated,
 XXVII. 28. XXIX. 20. XL.
 23.
 With its columnæ thicken'd,
 LXIV. 5.
 With scarcely any cavity, by reason
 of the entangled state of its
 fibres, XXVII. 28.
 Distended with a great quantity of
 blood, XXV. 2. XLIX. 24.
 Therein blood with air-bubbles, LIV.
 49. LVII. 10.
 Scarcely any blood, XLVIII. 44.
 LVII. 10.
 A remarkable polypous concretion,
 XXV. 2. XXXIV. 23.
 Heart, left ventricle of, dilated, XVII.

Preternatural A P P E A R A N C E S in dead Bodies.

21. XVIII. 8. XXVI. 21. 33.
XXVIII. 12. 28. XLV. 23.
LVI. 17. LXIV. 15.
- With its parietes extenuated, XVII.
21. XVIII. 2.
- Thicken'd, XXIX. 20. LVI. 17.
- Thicken'd and harden'd, XXV.
12. XL. 23.
- Become tendinous in several places,
XLV. 23.
- With its columnæ thicken'd, XXV.
12. XLV. 23.
- Become tendinous, XLV. 23.
- In a manner inflam'd, IV. 21.
- Therein an external, and not recent,
erosion, XXVII. 8.
- Some remains of internal erosion,
XXIV. 18.
- A great quantity of distending blood,
XXVII. 12.
- Of fluid blood, XL. 4.
- Scarcely any blood, XXV. 10.
- No blood, XXI. 3. XXXVIII. 30.
XLVIII. 44.
- Heart, auricles of, dilated, XVIII. 2.
XXIII. 6. LXIV. 5.
- Turgid with blood, III. 26. XXIII.
6. XXXVIII. 12.
- Therein none, or scarcely any blood,
XXIX. 18. XLVIII. 44.
- Remarkable polypous concretions,
VI. 12. VII. 11.
- Heart, right auricle of, mark'd with white
spots externally, III. 26.
- Beset with sebaceous granules,
LXVIII. 12.
- With a bony scale, XXVII. 16.
- Dilated, XVIII. 8. XXI. 49.
XL. 23. LVI. 7.
- Very much dilated, XVII. 6. 8.
10. XVIII. 6. XXV. 2.
- Much dilated with air, VIII. 23, 24.
By a polypous concretion, XX.
63. XXI. 3.
- Distended with a very great quan-
tity of blood, XVII. 10. XXI.
35. XLV. 23. LVI. 17.
- With extenuated parietes, XL. 23.
- Heart, left auricle of, much longer than
it is wont to be, XXI. 4.
- Larger than usual, XXIII. 6.
- Very much dilated, XXXVIII.
10.
- Contracted, XXVI. 21.
- Its adjacent sinus larger than usual,
and more internally unequal,
XVIII. 34.
- Very large, LXIV. 7.
- Heart, foramen ovale of, without the least
traces of a valve, XLVIII. 62.
- Heart, valves of, all small, LX. 8.
- One of them having an ossification,
XXX. 12.
- Sigmoid and semilunar valves of. See
Pulmonary artery, Aorta.
- Valvulæ tricuspidæ & mitrales, some-
what hard, XLVII. 16.
- Here and there thick, hard, and
white, XIV. 35.
- With a kind of glandular border,
III. 4. X. 19. XXVI. 17.
- Valvulæ tricuspidæ of, remarkably
unequal with one another, XVII.
12.
- Valvulæ mitrales, thicken'd, XXI. 15.
XXV. 10. XXVI. 33. XLVIII.
38.
- With a tuberos border, XXIX.
12. XL. 23. LXIV. 2.
- Somewhat-hard, or hard, IV. 26.
VII. 9. XXVI. 33.
- Bony, XXVII. 2.
- Enlarg'd and thicken'd, XL. 23.
- With a cineritious excrescence,
XI. 11.
- One of them of a cartilaginous hard-
ness in some places, LXIV. 19.
- Pretty hard, III. 26.
- With ossification, XLII. 34. LVI.
17.
- With an orifice and interstice be-
twixt its membranes, XXIII. 6.
- Heart, coronary arteries of, with very
large orifices, LXX. 10.
- Very much dilated, XXVII. 28.
- One of them bony, XXIV. 16.
- Heart, coronary vein of, a valve fix'd to
its orifice all round, and only
pierc'd through with small fora-
mina, III. 20.
- A slender filament of the valve in
the same place, LXVI. 9.
- Heart, fill'd with blood, XIX. 49. XXI.
34. 49. XXIII. 6. LXIV. 19.
- Extremely full, XLVIII. 62. LXVI.
17.
- Therein a fluid and frothy blood, LIII.
18. LIV. 16.
- No blood at all, LIV. 45. LXIX.

- A remarkable polypous concretion, IV. 21. VII. 4. XX. 63. XLIX. 10. 24. LVII. 14.
- Polypous concretions on both sides, VII. 4. 9. 11. XI. 11. 22. XIV. 35.
- Which resisted distraction very much, XLIII. 28. XLVIII. 38.
- Some on the right side, not on the left, V. 11. VI. 10. X. 7. 11. XXI. 3. XXX. 4. XL. 4. XLIX. 6. 8. 10. LXII. 5.
- Et vice versa, XXI. 47. XXXVIII. 13.
- The larger on the right side, X. 5. XVI. 2. XX. 2, 3. 5. 24. 32, 33. 35. 36. 39. 41. 43. 47. 49. 51. 55. 59. 61. XXI. 19. 23. XXII. 15. 22. XXIV. 6. 13. 18. XXV. 4. XXX. 2. XXXVIII. 4. XLI. 4. XLII. 34. XLIII. 5. LI. 6. 20. LIII. 9. 16. LIV. 26. LX. 4.
- Et vice versa, VII. 4. XVI. 17. XX. 26. XXI. 30. 32. LVI. 10.
- Larger about the auricles than the arteries, X. 13. XX. 2, 3. 51. XXI. 32.
- Not altogether so, XX. 59. XXI. 23.
- Remarkable ones, produc'd into all the larger vessels that communicate with the heart, VI. 12. VII. 13. LXIV. 2.
- Into the pulmonary artery, X. 7.
- Heart, ulcer of, XXV. 17.
- Rupture in left ventricle of, XXVII. 2. 5. 8. LXIV. 15.
- Wound of the same ventricle, LIII. 26.
- Of the right, LIII. 3. LXIX. 4.
- Hernia, crural, sacculus of, XXXIV. 15.
- Enterocoele, sacculus of, XXXVIII. 2.
- Gangrenous, V. 19. XXXIV. 5. 9.
- With an orifice three inches wide, XXVI. 37.
- Epiplocele, sacculus of, XXI. 15. 19. XXXIV. 9.
- Omphalocoele, sacculus of, XXXIV. 11.
- Oscheocoele, sacculus of, XLII. 34.
- Hydatids, large. See Kidnies.
- Hyoides os, small watery tumour connected to, L. 18.
- Hypogastric arteries, wider and harder than usual, and not without ossification, LVI. 18.
- I
- J**AW. See Maxilla.
- Jejunum intestine, mark'd with small spots of a red colour degenerating into lividness, IV. 26.
- Ileum intestine, with unusual folds and convolutions, XXI. 19. XXXIX. 29.
- With a part of it descending deeper than usual into the pelvis, LXII. 5.
- The whole of it drawn up above the navel, and heap'd up into a protuberating tumour, XXXIX. 26.
- In great measure inflam'd, XXXIV. 23.
- A little livid in part, LXIV. 15.
- Beginning to be livid, XXXV. 2.
- For considerable tracts of a black and red colour, XXI. 9.
- Blackish in some part, XLI. 10. XLIII. 27.
- Affected with a gangrene, XXXI. 2. XXXIV. 9. 11. 18. XXXV. 6.
- Ileum intestine, of a red colour internally, in some places, degenerating into lividness, and tumid, III. 4. XIX. 17. 18.
- Inflam'd at the termination, XVII. 19.
- Mark'd with black spots at the termination, XLIX. 8.
- Of a bright red colour degenerating into brown, LIV. 39.
- Gangrenous, XXXI. 2.
- Ulcerated, *ibid*.
- Having glands internally full of a kind of white matter, XXXV. 6.
- Two prominences of a red substance, XIV. 35.
- Ileum intestine, wounded, LIV. 33.
- Lacerated in three places by musquetballs, LIV. 20.
- Transfix'd, LIV. 31.
- Quite cut asunder transversely, LIV. 14.

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- Ileum intestine, ulcer of, IV. 26.
 Foramen of, XXXIV. 9.
 Iliac region, black, LIV. 26.
 Vessels, cover'd with a chain of glands, XLIX. 18.
 More slender on one side than on the other, XLVI. 17.
 Iliac arteries, dilated, XXXVIII. 40.
 One of them more narrow than natural, and having thinner parietes, LVI. 18.
 Both very tortuous, XIX. 58. XXXVII. 30. XL. 23. XLII. 34. XLIX. 18. LX. 4.
 One of them, XLIII. 22.
 Both very hard, LVII. 10.
 Internally rugous and brown, XLIII. 22.
 Having parallel lines in a longitudinal direction, LXIV. 2.
 Bony scales, XXIV. 16. XXXVII. 30. XL. 23, 24. XLII. 11. XLIII. 17. LX. 4. 6. 12. LXVII. 11 14.
 Body hardness and white spots, XLII. 34.
 Beginning of ossifications, LXIV. 7.
 Bloody erosions, LXVII. 14.
 Iliac veins, very much distended with blood, VIII. 27.
 Affected with a kind of corrugation, XL. 23.
 One of them twice as long as the other, XLVIII. 34.
 Wider than usual; the other contracted by the coalition of the parietes with each other, and opening by small orifices into the cava, LVI. 10.
 The external of them harder than usual, by reason of its coats being thicken'd, and some internal little chords, XXXVI. 23.
 Iliac ossa, junctures of, with the sacrum relax'd, XLVIII. 44.
 The margin of one broken into small pieces, LIV. 4. 22.
 The internal surface of one cover'd by gangrenous muscles, XXXIV. 25.
 Innominatum os, one larger and thicker than usual, LXIX. 10.
 More prominent anteriorly, LVI. 10.
- Pus betwixt it and the peritonæum. See Peritonæum.
 Having a very deep acetabulum, the surface of which was that of a conic cavity, and the orifice very large, LXIX. 10.
 A bloody acetabulum, LVII. 2.
 An acetabulum with a bony super-ficies, LXIX. 10.
 With a supercilium including two bony laminæ, LVII. 2.
 With the cartilage of the acetabulum here and there eroded, LVI. 10.
 Brown, lurid, and in some places red, LXIX. 10.
 With the natural acetabulum diminish'd, and a new one form'd, LVI. 12. 14.
 With the mucilaginous gland, and the cavity for it to lie in, deficient, LIX. 10.
 The mucilaginous gland of one enlarg'd, *ibid.*
 Inguinal glands, become preternatural or thicker than usual, XXI. 19. XXXIV. 18.
 Intercoastal muscles, black from inflammation, as if bruise'd, XXI. 45.
 Intercoastal vessels, broken through, LII. 34. 35. LIII. 18.
 Intestines, connected to one another, XVII. 17. XL. 9.
 By a kind of flaccid membranes, X. 13.
 Drawn up to the mesentery, LIX. 7. 18.
 Driven upwards, LVI. 12.
 Almost all drawn up under the liver, and connected with it by a kind of membrane that cover'd them, LXVII. 17.
 In a disturb'd situation, XLV. 23.
 Thinner than usual, LXX. 5.
 Very much contracted, XXX. 7. XXXIX. 33. XLIX. 14.
 With coats somewhat rigid, and almost dried up, LIX. 18.
 Lax, XLIV. 21. LXVIII. 6.
 Quite empty and almost collaps'd, XXXVIII. 24.
 Distended with air, V. 19. VII. 11. VIII. 25. 27. X. 11. XI. 13. XVII. 10. XXI. 9. 35. XXII. 10. 22. XXX. 4. XXXI. 5. XXXIV. 5. XXXVI. 25. XXXVIII.

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XXXVIII. 22. XLV. 23.
 XLVIII. 28. 32. LII. 8. LIII.
 16. 18. LIV. 16. 35. LV. 10.

Very much distended with air,
 XLVIII. 44. LIV. 2. 49.
 Distended with hard excrements, IV.

30.
 Containing much æruginous, and,
 by experiment, poisonous bile,
 LIX. 18.

Bloody matter, XXIX. 10.

A livid serum mix'd with pus,
 XXXIV. 25.

A black humour, LIII. 18.

A very black matter, XXXI. 5.
 Smelling more offensively than usual,
 XXI. 3. 9. 17. XXVIII. 12.

Intestines, having blood very closely ad-
 hering to their surface, LIII. 3.

Perfectly pallid, XXII. 10. XXXVIII.
 16.

Of a preternatural colour anteriorly,
 XXX. 4.

Ting'd with the colour of the bile to
 a great extent externally, LXV.
 5.

With their veins very much distended,
 LIX. 12.

Here and there red, XXXV. 2.

Of a yellow colour degenerating into
 brown, LXVI. 9.

Somewhat livid, XLI. 13. XLII. 20.
 LXX. 7.

Livid, XXVIII. 12. XXIX. 14.
 XXXIX. 29. XL. 2.

Here and there, LXX. 5.

Black, as if from contusion, LIV.
 22.

Here and there red, livid, black,
 XXXIV. 25.

Red, XXXV. 2.

Inflam'd, as it were, XXXVIII. 52.
 XLIV. 21.

Suffus'd with a slight inflammatory
 redness, VI. 8. VII. 9. 11.
 VIII. 8.

In some places, XXI. 3. XXVI.
 21.

Inflam'd, XXXI. 25. XXXIV. 7. 21.
 XXXV. 12.

Here and there, LIX. 15.

All very much inflam'd and red,
 XXIX. 10. LIV. 20.

Of a red colour degenerating into
 green, LXV. 8.

Some of them affected with a gan-
 grene, XXXV. 18.

Of a blackish colour, XXXVIII.
 30.

Black in most places, LIV. 26.

Perforated in many places, XXXI.
 2

Externally unequal with little tu-
 bercles, XXII. 18, XXXVIII.

34.
 With hydatids, XXXVIII. 34. 35.

Intestines, small. See Duodenum, Jeju-
 num, Ileum.

Extended within the lower part of
 the pelvis, XXXV. 10.

Connected closely to one another,
 and contracted into one heap,
 XXXIX. 26.

Some of them connected together by
 a kind of cartilaginous substance.
 XXXIX. 29.

Very streight in some places, XXXV.
 18.

Very much distended with air, LIV.
 39.

In the greater part, XXXVIII. 34.
 LXII. 5.

Some of them full of globules of
 fæces, XXXIX. 29.

Distended with a fluid and yellowish
 matter, XXXIV. 9. 11. 18.

Intestines, small, unequal in some places
 with very small tubercles full of
 air, XXVI. 21.

Livid, XLVIII. 38.

In a certain place, LIII. 37.

Of a cineritious colour degenerating
 into brown, LIV. 46.

Variegated with a livid colour, IV.
 24.

Somewhat red and slightly livid,
 XXVI. 31.

Of a brown colour degenerating into
 lividness, XVIII. 2.

In some places brown, and in others
 red, ibid.

Somewhat red and dilated, XVI. 38.
 XXXIV. 33.

Somewhat red, LXIV. 5.

Some of them partly red, XLV. 23.

Very red, XXVI. 13.

Red for considerable spaces, XXI.
 17.

Of a bloody colour here and there,
 III. 2.

I N D E X referring to

Beginning to be inflam'd in a few places, XXI. 23. 35. XLVII. 32.
 In a manner inflam'd, XXI. 49. XLVIII. 37. LII. 8.
 Inflam'd in a certain place, V. 19.
 Inflam'd in the greater part, XX. 43.
 Here and there, XXXIV. 9. 11. 18. XXXIX. 26.
 Some of them almost black, as it were, XXXVIII. 15.
 Almost all of them of a red colour inclining to black, XXXV. 16.
 Blackish in some places, XXXVIII. 34.
 Almost all of them, XXXIX. 26.
 Black in a certain place, as if from contusion, LIV. 41.
 Gangrenous, V. 19.
 Black, XXXIV. 5.
 All very black, XXXV. 14.
 Intestines, small, mark'd for some extent internally with bloody spots, XXXIV. 33.
 Internally yellow, LXII. 5.
 With the glands of Peyerus enlarg'd, LXVIII. 12.
 With an intus-susception, XXXIV. 33.
 Intestines, small, some in the sacculus of a hernia, V. 19. XXVI. 37. XXXV. 5. 9. 11. XLIII. 4. 5. 27.
 With a part of their parietes only, XXXIV. 18.
 Strongly annex'd to the testicle, V. 2.
 Intestines, large. See Cæcum of the ancients, Colon, Rectum.
 Narrow, XLIX. 14.
 Red in some places, XIV. 35. XXXV. 10. LXV. 5.
 Inflam'd, XXIV. 18.
 Black, XXXI. 14.
 With bloody glands, *ibid.*
 With glands eroded, *ibid.*
 Their appendicula vermiciformis, none, XXVI. 37.
 Somewhat turgid and red, XXX. 7.
 In the scrotum, XLIII. 2.
 Jugular glands, indurated, XVII. 19. XXIX. 12.
 Hard and swollen, LV. 20.

Enlarg'd, particularly the two larger ones, and purulent, XXIX. 12.
 Jugular veins, internal, wider than natural, VIII. 11. XLIII. 22.
 Very much distended with blood, IV. 24.
 Internal and external, distended with blood, XIX. 49.
 Jugular vein on the left side, coat of it grown very thick, XVII. 19.

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K IDNIES, one only, XXV. 4.
 Kidnies, larger than natural, XXXVI. 20. XLI. 4. XLII. 20. 28. XLVI. 17. XLVIII. 32.
 One of them very large, LVII. 10.
 Weighing, together with its thicken'd coats, six-and-thirty ounces, LXVIII. 12.
 Kidnies, small, XXXVIII. 12. XL. 22, 23. XLII. 2. XLIV. 15.
 One much less than the other, XL. 24.
 By one half, XII. 2.
 Kidnies, longer than natural, XXXVI. 23. XLIV. 19. LVI. 10. LVII. 10.
 One longer than the other, LX. 12.
 Shorter and curv'd into itself, X. 19.
 Kidnies, one of them very large, and the other more contracted than usual, XLII. 40.
 One of them larger than natural, and the other almost consum'd, XL. 12. 18.
 One of them much narrower than the other, XLVIII. 35.
 One round, and diseas'd by calculi; the other twice as big as is natural, IX. 12.
 Kidnies, unusual figure of, XLII. 2.
 Kidney, coats of, join'd one with another, thicken'd, and indurated, XLII. 20.
 Proper coat of, indurated, XXXVII. 28.
 Blood extravasated under it, XXXIV. 21.
 Kidnies,

- Kidnies, adipose coat of, monstrously thick from the steatomatous matter, LXVIII. 12.
 Stuff'd up with hard fat, IV. 19.
 In one of them with a somewhat livid fat, LV. 11.
- Kidnies, pallid, XLII. 28.
 Not in a good state externally, LXIV. 7.
 Not very sound in their surface, XLVIII. 34. LX. 12.
 Surface of, furrow'd, LXX. 7. 9.
 Cicatriz'd, or apparently so, XL. 21. XLII. 39.
 One, XXVII. 2. XXIX. 12. XL. 21. 23. XLII. 39. LVI. 10. LX. 4.
 Unequal, IV. 19. XL. 21, 22, 23, 24. XLVIII. 37. LX. 4.
 One, XLVI. 20.
 From sanious protuberances, XLII. 2.
 Both made unequal on their surfaces by so many small hemispheres, as it were, XLIV. 15.
 One, XLII. 13.
 Surface ulcerated in one, XXVII. 2. XLII. 20.
 Hollow'd out with deep hydatids, LXIX. 2.
- Kidnies, to one of, a morbid gland lying near externally, XVII. 25.
- Kidnies, more hard, more firm, and compact than usual, XLIV. 15.
 One of them, XLII. 20.
 Both more soft and lax than is natural, IV. 2. XXVII. 2. 28. LV. 10.
 One, XXI. 36. XLII. 13.
 With their cavities enlarg'd, and their substances diminish'd, IV. 19.
 With a great quantity of fat within, XLVI. 29.
- Kidnies, internal structure of, confus'd, XLII. 11.
 Not without marks of ulceration, IV. 19.
 With sanies externally, XXXVI. 20.
 With a little pus within, *ibid.* & X. 13.
- Kidnies, one inflam'd in some measure, XVII. 10.
 Smelling offensively, XL. 24.
 Abounding with pus, XLII. 20. 28.
- Distended with pus and urine, XLII. 15.
 Suppurated, XLII. 25.
 Half-corrupted, XLII. 28.
 Almost the whole substance in one being utterly consum'd, XL. 12. 18. XLII. 13.
 With the cells internally distended with pus, XLII. 20.
- Kidnies, distended with urine, IV. 19.
 With sinuous cavities full of urine, XL. 20.
 One with a cell fill'd with a urinous fluid, IV. 19. X. 19.
 In so great a quantity as to occupy half the kidney, XVII. 14.
 With large cells full of a fluid of that kind, XL. 2.
 With cells full of an aqueous kind of fluid, XXI. 15. XXIV. 6. XXVII. 2. XXXVIII. 40. XLII. 11. XLVI. 20. XLVII. 34. LX. 12.
 One protuberating outwardly, like an apple, XXXVIII. 40.
 With hydatids, XXV. 4. XXXVIII. 12. LVI. 18.
 One very large, form'd upon it, LX. 6.
- Kidnies, with calculi. X. 11. XL. 2.
 Within a hard and callous substance, LVII. 10.
 Large and ramifying, *ibid.* & XLII. 4.
 One with calculi, IX. 2. XI. 6. XL. 12. XLII. 13. XLVII. 8.
 With sandy particles, XXXIX. 5.
- Kidnies, membranous tubuli of, dilated, XXXIX. 33.
- Pelves, dilated, *ibid.* & XII. 2. XL. 18. 24. XLII. 11.
 One much dilated, XXXIX. 5. XL. 2. 18.
 Distended with pus, XLII. 20.
 With white and turbid serum, XLIV. 15.
 With ichor, XXXVIII. 30.
- Pelves, with a kind of purulent urine, XLVIII. 32.
 Pelves, none, XXVII. 28.
- Kidnies, one of, pass'd through by a wound, LIII. 40.
- Knee, lateral ligament of, thinner than is natural, LVI. 26.

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Capſular ligament and mucilaginous gland of, many bony globules growing thereto, LVII. 14.
 Mucilaginous gland of, become enlarg'd, and ſomewhat hard, LXIX. 2.
 Mucilage of, having a colour not natural, *ibid*.
 Mucilage of, none, LVII. 14.
 Knee-pan. See Patella.

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L Achrymal duct, larger, coalition of, XIII. 27.
 Canal and punctum, dilatation of one, *ibid*.
 Lachrymal puncta, occluſion of in others, *ibid*.
 Larynx, external membranes of, turgid with ſtagnating ſerum, IV. 24. 26.
 Protuberating poſteriorly into two condylomata, as it were, XLIV. 3.
 Veſſels of, turgid, XXI. 30.
 Larynx, beſet with a puſtaceous pus, XV. 13.
 Externally livid, internally ſomewhat red, IV. 26.
 Gangrenous, V. 19.
 Of a red colour inclining to blackneſs, VIII. 25.
 With a puſtule of the ſmall-pox, XLIX. 32.
 With cancerous tumours, XXVIII. 9, 10.
 With the internal membrane more red than uſual, and ſomewhat tumid, XLIV. 3.
 Ulcerated, XV. 13.
 Larynx, annular cartilage of, broken, XIX. 13.
 One of its arytenoids luxated; as it were, and not parallel to its fellow, XLIV. 15.
 Membrana epiglottidis of, criſp'd up, VIII. 27.
 Tumid, very red, and beginning to be ſuppurated, XLIV. 3.
 Epiglottis of, not quite ſound, XLII. 39, 40.
 Perforated with an ulcer, XXVIII. 10.

Deform'd with cicatrices, XLIV. 15.
 Leg, extenſor muſcles of, reſiſting the flexion, LVI. 26.
 Bones of, broken longitudinally, LVI. 31.
 Lips, lividneſs of, XXIV. 34.
 Liver, large, IV. 16. 30. XIII. 3. XVI. 4. 38. XXI. 33. XXX. 12. XXXVI. 23. XLVIII. 37. 38. LIV. 37. LXIX. 2.
 Somewhat larger than natural, XLII. 11. 39. LIII. 24.
 Very large, XXI. 24. 36. XXX. 10. 14. XXXVI. 2. 25. XLV. 16. LXIV. 15.
 Very long tranſverſely, XIX. 58. XXI. 30. XXVI. 31.
 Extended into the left hypocho-
 ndrium, XLVIII. 37. LIV. 37.
 Contracted, XXII. 4. LXIV. 7.
 Part of its ſubſtance deficient from the original formation, III. 4.
 Liver, right lobe of, deeply ſubdivided, XLVIII. 37.
 Extending downwards in part, LXVII. 11.
 Growing out quite to the lower part of the belly, XXXVI. 2.
 Growing out to the left ſide, XXXVI. 25.
 More convex than it naturally is, XXXVIII. 34.
 Conſiderably furrow'd on its convex ſurface, XLVIII. 38. LVI. 17. LXV. 8.
 Liver, thruſt downwards, XVII. 25.
 Downwards, and to the left ſide, XVI. 26.
 Driven upwards, XXXIX. 2. LVI. 12.
 Liver, grown into one ſubſtance with the diaphragm, VII. 11. XI. 6. XXXVIII. 34. XL. 23. XLIV. 19. LVI. 31.
 Cloſely connected with the ſpleen, XVII. 6.
 Tied to the neighbouring parts by unuſual membranous textures, XVI. 30.
 Liver, of a colour not natural, XLII. 13.
 Colour of, loſt in one part, in another yellowiſh, XLIII. 22.
 Pallid, XVI. 38. XXI. 35. 47. XXII.

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- Internally and externally beset with vesicles containing pus, XXII. 24.
- On one side with an abscess, XX. 9. 11. 20. 41. 61. LIII. 9.
- With an abscess ruptur'd within the thorax, LIII. 14.
- Full of pus every-where, or in part, LXII. 2. LXIII. 19.
- Lungs, with pus, XXI. 17. 27.
- With ulcers, XXII. 15.
- On one side with an ulcer, XX. 5. 43. 63. XXII. 14. 16. 18.
- With a cancerous ulcer, XX. 39.
- Lungs, on one side, or on both, with tubercles, either not yet, or already suppurated, I. 2. VII. 13. XVI. 25. XX. 49. XXI. 27. XXII. 6. 14. 15. 18. XXVI. 29. LI. 17. 20. LIII. 16. LX. 2.
- With purulent steatomata, XXII. 22.
- With purulent, or puriform ichor, XIX. 49. XXIV. 13. XXX. 4. LXIV. 5.
- With a putrid humour, VI. 12. XX. 7. 45. XXI. 45. XXII. 4.
- With certain sinusses, as it were, containing different pus, XXI. 33.
- With much blood, II. 19. IV. 21. VIII. 4. 25. 27. XIX. 51. XXVII. 2. 12. LI. 54.
- With much, and even bloody serum, XVII. 19. XXI. 33. XXX. 2. XXXIV. 18. XXXVI. 17.
- With froth, V. 11. XVIII. 30. 34.
- With a somewhat-bloody jelly, XVII. 21.
- With a frothy humour, VI. 12. VII. 11. XXI. 29. XXVI. 31. XXXVI. 11.
- With a catarrhus matter, XIII. 3.
- With much fluid of a yellow or tawny colour, XXI. 23.
- With empty cells within a substance of a livid and deep black colour, XXI. 19.
- With the vesicles of which they consist dilated, XXII. 12. LXII. 5.
- Lungs, with very small calculi, XLII. 2.
- With many globules of a tartareous matter, XVII. 19. XLVII. 12.
- With a white substance, as if of tartarized granules, XXI. 36.
- With stony granules in several places through the coat, LXVIII. 12.
- Lungs, tophaceous, XV. 25.
- Lungs, on one side, wounded, LIV. 10.
- Ruptur'd, LIII. 33.
- Lungs, bronchia of. part of the food in them, LIII. 26.
- A considerable quantity of serum, IV. 24. 26. V. 17.
- A reddish foam, IV. 16.
- Bloody humour, XXI. 34. XXIII. 6. XXVI. 21.
- Blood, XXXV. 2.
- Pus, or puriform matter, XVI. 30. XXI. 29, 30. XXIII. 6. XXVI. 33. XLI. 23. LX. 6.
- Lungs, bronchial glands of, more than usual, XLVIII. 38.
- In greater number and thicker, XVIII. 2. XXI. 33.
- Enlarg'd, XVII. 14. 17, 18. XLIII. 17. 29. XLVIII. 38. LIV. 37.
- Not all found, XXI. 29.
- Become harder than usual, larger, and more purulent, XXIX. 12.
- Having a tartareous matter within them, XLVIII. 38.
- Lungs, on one side, having their blood-vessels very closely connected with the bronchia, XXI. 4.
- Having some one of their vessels dilated, *ibid*.

M

- M**AXILLÆ, very closely constricted, IV. 26.
- Maxilla, inferior, longer and narrower than usual, XLVIII. 50.
- In one of its heads a bony excrescence, LVI. 21.
- Some fissures on its interarticular cartilage, *ibid*.
- Maxillary internal glands, larger than natural, LXIII. 19.
- One of them indurated, XXVIII. 9.
- Mediastinum, forc'd towards the left side, XVI. 26.
- Cover'd; in part, with a reticulated texture yellowish and bloody, XXI. 30.
- Become thicken'd, XVI. 26.
- Beset with sebaceous tubercles about the middle, LXVIII. 12.
- Wounded,

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- Wounded, LIII. 3. 26. LXIX. 4.
Medulla Oblongata. See Cerebrum.
Medulla Spinalis. See Spine.
Medulla Spinalis, none, XLVIII. 48. 50.
Without the tube of the vertebræ,
XII. 16.
The meninges of it suffus'd with
blood, LX. 4.
Dura mater of it adhering to the
arachnoides, XLIX. 16.
The vessels of itself and its nerves
turgid with blood, X. 17.
Blood extravasated about it, III. 2.
LX. 4.
Water, IV. 7. 21. 24. 30. V. 11.
XV. 6.
At the beginning of it, LI. 27,
28.
Medulla Spinalis, very lax, LXX. 5.
From the external part of it a con-
siderable quantity of water dis-
charg'd, XXXVII. 2.
Blood, express'd therefrom, LII. 5.
Membranes, all giving great resistance to
the knife, XLIV. 3. LX. 10.
LXVII. 17.
Membranous follicle, form'd about a
leaden ball, XXVII. 28.
Mesentery, contracted, LIX. 18.
Extending itself into the hernial sac,
XXVI. 37. XXXIV. 9. 11.
And there fleshy, as it were,
XXXIV. 5.
The smallest particles of its fat agi-
tating themselves by a tumul-
tuary motion, XXXI. 5.
Mesentery, inflam'd, XXXIV. 18.
Of a red colour inclining to green,
LXV. 8.
Blackish, XXXVIII. 30.
Wounded, LIV. 33. 35.
Tumid, LIV. 35.
Mesentery, glands of, enlarg'd, XXIV.
18. XXVII. 16. XXIX. 20.
XXXVIII. 34. XL. 23.
XLVII. 24. XLVIII. 38.
XLIX. 18. LIV. 39. LX. 12.
LXIV. 7. LXV. 5. LXVI. 6.
LXX. 7.
Some very large and purulent, XXIX.
12.
Somewhat hard and scirrhus,
XXVII. 16. XXXVIII. 34.
Converted into a sanious tumour,
XXXI. 2.
Mesentery, some obstruction of, XXX.
10.
Frequent tubercles of, XXII. 18.
Tubercle of, partly bony and partly
stony, XXXVI. 23.
Peculiar globe of fat therein, XLIV.
3.
Tumours of, XXXIX. 9.
Large tumour of, XXXIX. 5.
Very large, XXXIX. 2.
Abscess of, suddenly ruptur'd, XLVI.
20.
Many small abscesses and ulcers of,
XXXIV. 21.
Sebaceous tumours of, LXVIII. 12.
Mesocolon, part of, rigid, and mark'd
with red spots, LV. 10.
Sebaceous tumours in the left part of,
LXVIII. 12.
Mola, spurious, discharg'd with the fœtus,
XLVIII. 9, 10.
Mouth, distortion of, XIX. 3.
Mouth, foam from the, in a dead body,
XXVI. 35.
A bloody fluid, IV. 16. XXVI.
35. XXVII. 2.
A great quantity of putrid matter,
XXXV. 14.
Pus, XXII. 6.
Muliebria. See Clitoris, Nymphæ, O-
varia, Pudendum, Falloppian
tubes, Vagina, Urethra, Ute-
rus.
Muscles, pallid, LI. 19.
Of a brown and dirty colour, LXIX.
2.
Lax, XI. 11. 13. XIX. 58. XXXV.
10. LII. 8. LXIX. 8.
Many abscesses betwixt, LIII. 24.
Muscles, that lie upon the spine, wounded
on their internal surface, LIII.
40.

N

- N**AILS of the great toes, growing
out into oblong and infected
little horns, LXVIII. 6.
Nerves. See Cerebrum, Medulla Oblon-
gata.
Nerve, small, one of the cervicals, cer-
tainly prick'd. XIV. 3.
Nerve, posterior crural, eroded, L. 11. 55.
Nerve, intercostal, trunk of, wounded,
LIII. 40.
Nerve,

Nerve, optic, extenuated, XIII. 8, 9.
 LII. 30. LVI. 21. LXIII. 4.
 8.
 Of a brownish colour, XIII. 9.
 Of a cineritious colour, XIII. 8.
 LVI. 21. LXIII. 8.
 Of a dirty flesh-colour, LII. 30.
 Having its coats thicken'd, XIII. 8.
 15. LII. 30. LVI. 21. LXIII.
 6.
 Consisting of a substance less and
 more moist than usual, LXIII.
 6.
 Harder than usual, XIII. 9.
 LXIII. 4.
 Hollow, and full of turbid humour,
 XIII. 8.
 Of a bloody substance, LVI. 21.
 Of a mucous substance of a dirty
 flesh-colour, LII. 30.
 Nostrils of a carcase, pus from them, V.
 19.
 A bloody froth, XXVI. 35.
 A foetid water, XLVIII. 44.
 Nostrils, polypi of, beginning glandulous
 from a glandular membrane,
 XIV. 18.
 Nymphæ, in women, one of them very
 long, water lying betwixt its
 substance, XLVII. 12.

O

OCCIPITIS Os. See Occiput.
 Occiput, bone of, slightly incis'd
 externally, LI. 49.
 Fissur'd, *ibid*.
 Universally with a broad fissure,
 LI. 51.
 Eroded and perforated, LII. 38.
 Œsophagus, compress'd, XVII. 19. 25.
 XVIII. 22.
 Having gangrenous erosions, XXIX.
 20.
 Œsophagus, upper part of, of a red co-
 lour inclining to blackness,
 VIII. 25.
 Lower tract of, red and very wide,
 XXXVII. 30.
 Inflam'd, LIX. 15.
 Omentum, drawn upwards, IV. 19. 26.
 V. 6. VII. 11. XI. 6. XXIII. 4.
 XXVII. 16. XXXVI. 25.
 XLII. 34. XLV. 23. LII. 2.

30. LIV. 39. 46. LV. 90. LVI.
 31. LXIV. 5.
 Roll'd upwards and extended, XXIX.
 12.
 Contracted upwards into itself, and
 converted into a scirrhus,
 XXXIX. 26.
 Drawn upwards in part, and covering
 the stomach, LIII. 40.
 Drawn downwards, XXXIV. 9.
 Descending within the scrotum, II.
 20. XXI. 15. 19. XXXIV. 9.
 XLIII. 2. 31.
 Within the sac of an omphalocele,
 XXXIV. 11.
 Of a bubonocoele, XXXIV. 18.
 Very short, V. 17. VII. 11.
 Very large, XXV. 4.
 Omentum, annex'd to the peritonæum;
 XXII. 18. XXX. 7. XLII.
 20.
 To the intestines, XXI. 33.
 XXXIV. 21. XXXVII. 30.
 LVII. 2.
 To the mesentery, XXII. 18.
 To the fundus uteri, XLVII. 14.
 Omentum, very thick, and very fat,
 XIV. 27. XLVII. 14.
 Extenuated, and without fat, XXX.
 7. XXXVIII. 4. XXXIX. 2.
 XLII. 20.
 Very flaccid, XXIII. 4.
 Rigid, LV. 10.
 Almost consum'd, XXX. 22.
 Torn into pieces, and swimming in
 the water of the belly, XXXVIII.
 30. 34. XXXIX. 2. XLVII.
 8.
 Omentum, with its veins very much di-
 stended, LIX. 12.
 With hydatids, XXXVIII. 4.
 With pretty large glands, XLIII. 22.
 Twisted like a rope, XXV. 4.
 Twisted into protuberances of various
 colours, XXIX. 6.
 Chang'd in a part of it into a round
 body, XXXIV. 9. XXXVIII.
 34.
 Omentum, mark'd with red spots, LV.
 10.
 Inflam'd, XXXIV. 18.
 With its fat somewhat livid; LV.
 11.
 Black, as if from contusion, LIV.
 22.

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- Of a blackish colour, XVI. 30.
 Of a brownish colour inclining to green, XXXVI. 25.
 Green in part, LIII. 24.
 Cover'd with a kind of glandular globules, XVI. 30. XXII. 18.
 Full of sebaceous tubercles, LXVIII. 12.
 With many small abscesses and ulcers, XXXIV. 21.
 With its sanguiferous vessels ruptur'd, LIV. 14.
 Annex'd to the peritonæum, on account of a wound having formerly preceded, LXVI. 9.
Ovaries, none, XLVI. 20.
 One entirely deficient, the other small and morbid, LXIX. 16.
 One shorter than the other, XXIX. 10. 20. XXXV. 16. XLVIII. 35.
 Converted into hydatids, and of what kind, XXXIX. 12.
 Hydatids upon them, XLVII. 16.
 Large, and of what kind, XXI. 47. XXXIX. 12. XLVI. 29.
 An hydatid protuberating from one of them, LV. 10.
 A hollow little body on one of them, the remains of a ruptur'd hydatid, XLVII. 12.
Ovaries, proper ligament of, thicken'd, XLV. 16. XLVIII. 32.
Ovaries, one of them not quite sound, XLVIII. 32.
 Grown almost into one substance with the tube and the colon, in part consum'd by an abscess, XLVI. 27.
 Both confus'd with the tubes and their ligaments, and converted into a sebaceous and lacerated mass, XXXVIII. 34.
Ovaries, encreas'd in their size, XXII. 22. XXIX. 12. XXXIX. 33. XLV. 21. LII. 4. LXX. 10.
 Drawn behind the uterus by their weight, XLV. 21.
 More turgid with fluid than usual, LII. 4.
 Tumid from included cells, XLV. 23.
 One of them large, and containing water, LXVIII. 6.
 Distended by an internal hydatid, XV. 8. XLVIII. 34. LVI. 21.
 Enlarg'd into a considerable cellular tumour, XXIX. 14.
 Vesicular for the most part, XXXIX. 37.
 In some part of it, XXXIX. 39.
 Expanded into a tumour of five- and-twenty pounds, *ibid.*
Ovaries, very long, XLV. 16.
 Strigose, or shrivell'd, XXVI. 31. XXXIV. 33. XLV. 16. XLVI. 24. 29. XLVII. 28. 30. LV. 10. LVI. 17. 20.
 Small, XLVII. 30.
 Depress'd into a thin lamina, LVI. 17.
 Of an unequal magnitude, LVI. 20. LX. 10.
Ovaries, surface of, black, XXI. 47.
 Become tuberos from hydatids, LXX. 10.
 Divided into chequers, as it were, XLVI. 17. LVII. 14.
 Very unequal, LVI. 10. 20. LXI. 7.
 Coat of, mark'd with cicatrices, as it were, LII. 28.
 Perforated with a kind of small ulcer, *ibid.*
 Cartilaginous, in a manner, in several places. XXXV. 16.
Ovaries, consisting of a pretty soft and whitish substance, XLVII. 4.
 One converted into a sebaceous matter, XXXIX. 33.
 Pretty soft, and almost gelatinous, XLVI. 27.
Ovaries, somewhat hard, LXI. 7.
 Indurated, XVI. 4. XX. 2. XXI. 47. XXII. 22. XXIII. 4. XXXIV. 33. XLV. 16. XLVII. 31. L. 4. LII. 2. LVII. 14.
 Almost universally scirrhus, XXVI. 17.
 Scirrhus, XV. 13. XLV. 21. XLVI. 17. LXVI. 2.
 One of them. XXXIX. 33. 37.
Ovaries, without any vesicles, XLVII. 4. 31.
 Without any natural vesicles, XLVI. 29. XLVII. 30.
 With vesicles full of serum that flew off by boiling, LII. 28. With

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With black cells, XXII. 22. XLV.
 23. XLVII. 12. 28.
 Green, yellowish, yellow, or white
 cells, XXI. 29. XXIII. 4.
 XLVII. 30. LII. 6. 28.
 Containing a bloody humour,
 XXIII. 4.
 A half-coagulated blood, or quite
 so, XXIX. 12. XLVII. 12.
 XLVIII. 44. LII. 6.
 Black globules, XXI. 24. 29.
 XXXIX. 37.
 A brownish fluid, and some
 small bodies of a yellow co-
 lour, XXXVI. 17.
 White pus, XLV. 23.
 Or empty, XXI. 29. XXIII. 4.
 XXIX. 12. XXXVIII. 28.
 XLVI. 27. XLVII. 12. 30.
 LX. 6. 10.
 With cells almost cartilaginous, LII.
 2.
 Bony, XLVII. 28. XLVIII. 44.
 Ovaries, with blood half-coagulated, XXI.
 47. XXVI. 13.
 With whitish globules, LXIX. 16.
 Ovaries, sanguiferous vessels of. See Sper-
 matic.

P

PANCREAS, very much extenuated,
 XXX. 14.
 Larger than usual, XXX. 10.
 Become thicken'd, XXIV. 12.
 XXV. 16.
 In part, XVI. 36.
 Partly growing out into a soft white
 substance, XXIX. 12.
 Into a white and hard tumour,
 XXXVII. 28.
 Pancreas, white, XXX. 7.
 In part red, XLV. 23.
 In a manner inflam'd, XXVI. 21.
 Of a red colour inclining to black,
 in part, XXVI. 31.
 Pancreas, somewhat-hard, XXI. 17. 33.
 XXVI. 31. XXX. 7. XXXVIII.
 34. XLVII. 12.
 Hard, IV. 16. V. 19. XVI. 36.
 XXII. 22. XXVII. 2. XXIX.
 12. XXX. 10. 12.
 With distinct and dry lobules,
 XXX. 7.

And more firm than usual, XLV.
 23.
 Of indurated globules, as it were,
 XXXV. 16.
 Tuberos, XV. 11. XXX. 10.
 Full of sebaceous tubercles,
 LXVIII. 12.
 With a bony artery, XVI. 12.
 Parotid gland, tartareous matter therein,
 XI. 15.
 Parulis, IV. 26.
 Patella, cartilaginous crust of, furrow'd,
 and almost worn away, LVII.
 14.
 Penis, tension of, in a body after death,
 XIX. 19.
 Preputium of, very much constricted,
 LII. 30.
 With little ulcers, VIII. 6.
 Of a blackish colour, LXII. 5.
 With the glans verging to a gan-
 grene, XVIII. 25.
 Glans of, mark'd with cicatrices,
 XLII. 34. 39. 40. XLIV. 12.
 15.
 Urethra of. See Urethra.
 Pericardium, dilated, LXIV. 19.
 Affected with a phlogosis, XLV. 16.
 Inflam'd, VII. 11.
 Wounded, LIII. 3. 26.
 Thicker than usual, XVIII. 34.
 XX. 20. 35. XLIII. 17. XLV.
 16.
 In part, LIII. 29.
 Very thick in some places, XXII.
 10.
 Harder than usual, X. 19. XVIII.
 34.
 Cartilaginous in some places, XXII.
 10.
 With a white spot, XXXV. 12.
 Pericardium, beginning to adhere to the
 heart, LXII. 5.
 By a mucus and yellowish matter,
 XVIII. 25.
 By a few fibres, XXXVIII. 22.
 By many, XXXVIII. 13.
 Partly adhering to the heart, XXV.
 15. LIII. 29. LVI. 12.
 By two strong ligaments, as it were,
 XXIV. 2.
 Every-where adhering to the heart,
 IV. 19. V. 19. VIII. 6. XXII.
 4. 10. XXIV. 11. XXX. 7.
 XXXV. 12.

Strongly

Preternatural APPEARANCES in dead Bodies.

- Strongly connected, XL. 9. 4.
 Adhering to the right auricle, and to the large vessels, XXX. 7.
 Pericardium, cover'd internally by a polypous false membrane, XLV. 16.
 With whitish concretions here-and-there, XX. 35. 36. XXI. 2.
 With a certain reticular body, XX. 20.
 Pericardium, without water, VII. 2. XI. 13. XX. 24. XXXIV. 18. XXXV. 16. XXXVIII. 13. LXII. 5.
 Having scarcely any water, IV. 21. VII. 9. XXII. 16. XLIX. 2. LI. 20.
 A little, or in moderate quantity, XX. 55. XXVI. 37. XXIX. 10. XXXVIII. 2. XL. 23. 26. LVI. 17.
 Not in very small quantity, I. 2. XVII. 14. 25. XX. 2. XLIII. 17.
 In large quantity, X. 11. XVI. 2. 43. XX. 41. 47. 59. XXI. 2. 17. XXII. 14. 18. LI. 19. LIII. 9.
 A very great quantity, XVI. 34. 36. 40. XVIII. 28. XLIII. 29.
 Full of water, X. 2. XVI. 19. 21. XX. 11. 13. 30. XXII. 6. XXV. 15. XXVI. 20. XXVIII. 12. LIII. 18.
 Very much distended therewith, XX. 35. 36. XXIV. 2. XXXVIII. 6.
 Very greatly distended, XXXVIII. 10.
 Pericardium, containing much limpid water, XVI. 6.
 A great quantity of a whitish colour, XLV. 16.
 Turbid, or somewhat turbid, V. 17. X. 13. XX. 53. XXI. 9. 24. 36. XXII. 24. XXIV. 34. XLII. 11. XLV. 23.
 A great quantity similar to cow's whey, XX. 57.
 Yellow, or yellowish, VII. 11. VIII. 27. X. 7. XVII. 10. 21. XX. 20. XXI. 9. 30. 34. XXII. 22. XXIII. 6. XXIV. 13. XXXVIII. 34. LII. 8. LIV. 37.
 Yellowish, together with thick, and in a manner, mucous webs, XVI. 38.
 Similar to urine, XXVI. 33. LXIV. 5.
 Of a yellow colour inclining to green, XVI. 30. XXI. 17. XXXVIII. 30.
 Of a yellow colour inclining to reddish, XXI. 33.
 Reddish, XXI. 19. 24. 29. XXVII. 12. XXXI. 2. XLV. 23. LII. 8. LIV. 39.
 Red, XVIII. 2.
 Somewhat bloody, III. 2. IV. 24. XXVI. 35. XXX. 10.
 Bloody, III. 26. IV. 26. XXI. 3. XXXVI. 23. XLIV. 3.
 Thick, XI. 11. XVI. 17.
 A great quantity and purulent, XXIV. 2.
 Pericardium, full of blood, XXVI. 5. 7. 13. 15. 17. 19. XXVII. 2. 5. 8. LIII. 7. LXIV. 13. 15. LXIX. 4.
 Half-full, XXVI. 21. XXVII. 28. LIII. 26.
 Containing a yellow pus, mucous, and not in great quantity, LIII. 29.
 Pericranium, become thick from juices of a gelatinous nature, I. 4.
 Eroded by sanies, LI. 5.
 Peritonæum, livid, XLI. 13.
 Rough with small globules, XVI. 30. XXII. 18. XXXVIII. 34.
 Cover'd internally with a kind of hard glands, XLVII. 8.
 Peritonæum, tumour form'd upon, XXXVIII. 51. 52.
 Containing a very great quantity of foetid water within its eroded substance, XXXVIII. 52.
 Peritonæum, a great quantity of the most stinking water betwixt it and the muscles, XXXVIII. 51.
 Peritonæum, betwixt it and the os innominatum a great quantity of pus, LVII. 20.
 Pharynx, become rugous, XV. 15.
 Full of foam, of a yellow colour inclining to green, VIII. 25.
 Smelling offensively, as if from an inflammation inclining into gangrene, XXI. 29.

Having

I N D E X referring to

- Having its sides thicker than usual, and of a substance almost glandular, and yet viscid, XLII. 34.
- Of a red colour inclining to blackness, VIII. 25.
- With an ulcer, XXVIII. 12.
- With cancerous tumours, XXVIII. 9.
- Ulcerated, XXVIII. 10.
- With its vessels turgid, XXI. 30.
- Pineal gland. See Cerebrum, medulla oblongata of.
- Pituitary gland. See Cerebrum, third ventricle of.
- Pleura, very closely adhering to the ribs in a certain part, and almost callous, L. 48.
- Easily to be pull'd away, VII. 11. 13. XXI. 9. LII. 8.
- Become thicken'd, VII. 11. XXI. 29, 30. 35, 36. XXXIV. 18.
- Very much, XVI. 30.
- Become bony, XXI. 19.
- Rough with small globules, XVI. 30. XIX. 13.
- With very small and almost red tubercles, XXI. 32.
- With bony tubercles, XXI. 19.
- Almost bony, XXI. 23.
- Evidently injur'd, XXXI. 14.
- Slightly red, XX. 51. 53.
- Red, VII. 11. 13. XVI. 40. XXI. 33. 34. XXII. 16.
- Of a rosy-colour for considerable tracts, XLV. 16.
- Here-and-there, as if from very small blows, XVI. 30.
- Inflam'd, XX. 55, 56. XXI. 45.
- Almost livid, and somewhat-black, XXI. 35, 45. LIII. 14.
- Half-corrupted, and very lax, XXI. 36.
- Putrid, LII. 8.
- Pleura, lax, as if cover'd internally by a membrane, XX. 47. 56. 59.
- In a certain place, XLV. 16.
- Yellow and thin, XXI. 9. 17.
- Firm for a considerable tract, XL. 23.
- Apparent corruption of, only by reason of a membrane of that kind adhering to it, XX. 56. 59.
- Pleura, stromous tumours of, LXVIII. 12.
- Pleura, betwixt it and ribs, a considerable tumour, LIII. 32.
- Plexus Choroides. See Cerebrum, lateral ventricles of.
- Popliteal artery, aneurisms of, L. 9, 10.
- Prostate gland, small, XXIV. 18.
- Tumid, XLI. 13. XLIX. 18.
- Prostate, excrescences of, XLI. 6. 18. XLII. 11. XLIII. 24. LXVI. 6.
- Great hardness of, XLI. 13.
- Both the surfaces of, blackish, *ibid.*
- Internal surface of, ulcerated, XLII. 28.
- With three very short sinusses, XLIV. 15.
- With granules of tobacco, as it were, at the orifices thereof, VII. 11. XXIV. 6. XLIV. 21, 22.
- Prostate, within it many granules of that kind, VII. 11. XLIV. 19.
- A cavity fill'd with those granules, XLIV. 20.
- An empty cavity, XLIV. 19.
- A sinus containing a kind of calculous matter, XLII. 13.
- Prostate, caruncle of. See Seminal.
- Pubes, bones of the. See Pubis.
- Pubis Osia, almost disjoin'd from each other, XLVIII. 44.
- Pudendum Muliebre, small red tubercles of, XLVI. 17.
- Phlogosis of, *ibid.* & XLVII. 14.
- Pudendum Muliebre. See also Clitoris, Nymphæ.
- Pulmonary artery, wider than usual, XXIII. 6. XXV. 10. XXVII. 28. LXIV. 12.
- Much blood therein, XXVI. 21. 31. XXVII. 2. XLV. 23.
- A polypous concret on therein, VI. 12. VII. 11. XLV. 23.
- In its branches blood coagulated into the form of tubuli, XXIII. 6.
- Pulmonary artery, valves of, thicken'd, XXVI. 33.
- Become less flexible than usual, XL. 23.
- More hard than natural, VIII. 4.
- One of them only harder than usual, XXIV. 34.
- Cartilaginous and bony, XVII. 12.

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So connected together as scarcely to leave a foramen for the blood to pass through, XVII. 12.
 Pulmonary vein, trunk of, larger than it naturally is. See Heart, left auricle of.
 Putrefaction, speedy and very considerable signs of. XVIII. 34.

R

RECTUM intestine, very much contracted, LIV. 39.
 Very much compress'd, XXXIX. 12.
 Surrounded with too much fat, LXIX. 16.
 Inflam'd, and already livid, XXI. 29. LXV. 5.
 Black, X. 7.
 Internally tumid, LXV. 5.
 Harder and thicker than usual, and beset thick with glands, as it were, protuberating internally, XXXII. 7.
 With the same of a red colour inclining to brown, LXV. 5.
 With varicous knots of veins internally, XXXII. 10.
 With the hæmorrhoidal vessels internally tumid at the lower part, LIV. 7. LXVIII. 6.
 Ren succenturiatus, tumour continu'd to, XVII. 8.

S

SALIVARY glands, larger than usual, LII. 30. See also Maxillary, Parotid, Tonsils.
 Scapula, on one side, the sinus of it which receives the humerus deficient in a part of its edge, LVII. 2.
 Scrotum, tumefied with air, V. 19.
 Black, as it were, from contusion, XIX. 15. 19. LII. 30. LXII. 5.
 Scrotum, varicous veins of, resembling a chain, XX. 24.
 Fat of, lying under it even at the lower part, XLIII. 29.
 A great quantity of water in the cells of the dartos of, XXXVIII. 26. XLI. 18.

Scrotum, calculi within it, LXIV. 7.
 Scull. See Cranium.
 Semen Vas Deferens, in part scirrhus, XLVI. 5.
 Become thicker than natural, LXIV. 7.
 Seminales Vesiculæ, strigose, XLIV. 7.
 Containing a watry semen, XXIV. 18.
 Containing none at all, XLIV. 7. 10.
 One of them scirrhus, XLVI. 5.
 Seminal caruncle, strigose, XLII. 28.
 Defac'd and diseas'd, XL. 29.
 Almost fluid, as it were, LX. 12.
 Having its rostrum consum'd, ibid.
 Seminal caruncle, sinus of, longer than usual, and having a lax orifice, LXIII. 13.
 With a very large orifice, and plac'd transversely, LXIX. 2.
 With its orifice almost obliterated, XL. 29.
 Orifices of, for emitting the semen, larger than usual; and some of them larger than the other, XLIV. 22.
 One of them blind, the other very narrow, XLIV. 7.
 Septum Lucidum. See Cerebrum, lateral ventricles of.
 Sides, of a brown colour inclining to lividness, XXVI. 35.
 Sinciput, bones of, eroded and perforated, LII. 38.
 One only, LI. 19.
 Sinciput, bones of, livid in a certain place, both internally and externally, LII. 2. 8.
 The external table of it depress'd, as it were, LII. 8.
 Fissur'd with a chink, LI. 11.
 Broken into little pieces, LI. 9.
 Sinciput, bones of, fissur'd, LI. 50. LII. 35.
 Broken and depress'd, LI. 18. 32.
 Broken, and having two large fragments thrust down into the brain, LI. 35.
 Perforated, a bony scale protuberating, LI. 54.
 Smell, offensive. See Fætor.
 Spermatic vessels, fasciculus of, having a great quantity of fat, XLIII. 22.
 See also Testes, vessels of.

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Very turgid with blood, XXXIV. 5.
 Spermatic vessels, in a woman, containing blood of a violet colour, XXXVI. 17.
 Arteries, hard, LXVII. 14.
 Spine. See Vertebrae.
 Spine, in great part double, XLVIII. 57.
 Almost universally bifid, XLVIII. 50.
 Spine, universal tortuosity of, with a very great flexion at the lower parts of the thorax, LXII. 11.
 Total distortion of, the cervix excepted, XLVIII. 50.
 In the thorax, XIII. 3. XLIII. 17. LVI. 14.
 In the thorax and loins, LV. 10. LXIII. 19.
 Very remarkable, IV. 16. X. 13. XXXVIII. 40.
 Spine, distortion of at the lower part, XLVIII. 34. 35.
 Spine, vertebrae of, five only in the neck, XLVIII. 50.
 Forc'd together, and condens'd into one substance, at the upper part of the thorax, *ibid.*
 Thoracic vertebrae of, a hiatus in them posteriorly, XLVIII. 52.
 Lumbar, hiatus and consumption of, on the back part, XII. 16.
 Exostoses of, XXXVII. 30.
 Spine, vertebrae of, hollow'd out by an aneurism, XVII. 17.
 Spine, tube of for spinal marrow, none at all, XLVIII. 48.
 Water therein, X. 13. XI. 13. XXI. 47. XXXVIII. 34. LXIX. 16.
 In great quantity, X. 17. XI. 15. LIV. 49. LXI. 2.
 Blood, grumous, in the loins, but not in great quantity, LIV. 25.
 Pus, XIV. 3. 5.
 Spine, tumour of, wherein were the spinal marrow and water, XII. 16.
 Spinal marrow. See Medulla, and Spine.
 Spleen, forc'd upwards, XXXIX. 2.
 Driven towards the scrobiculus cordis, LVI. 12.
 Situated lower than usual, XXI. 33.
 Fallen down to the groin on the right side, XXXIX. 42.
 Pretty closely connected to the diaphragm, XVIII. 2. XXI. 49. XXIX. 20.

To the stomach, XXIX. 20.
 The liver, XVII. 6.
 All the neighbouring parts, XX. 26. XXII. 4.
 Spleen, very small, XVI. 10. XXV. 10. XXVII. 16. 28. XXX. 14. XLIV. 21. I. 4.
 A little thicker than usual, XIV. 35.
 Thicken'd preternaturally, XVIII. 2. XL. 23. XLVIII. 38. XLIX. 18.
 Thicken'd and become wider, XLIV. 19.
 Somewhat larger than usual, XVI. 28. XIX. 58. XXIX. 12. 20. XXXVIII. 10. 16. XLII. 20. L. 48. LIII. 24. 26. LIV. 37. 39. LVI. 31. LIX. 15. LXIV. 5. LXVIII. 6.
 Large, IV. 16. 24. 26. 30. V. 19. X. 19. XI. 6. XVI. 2. XVIII. 25. XXI. 6. 9. 24. 30. 33. 35. XXII. 22. XXV. 2. XXX. 12. XXXI. 2. XXXV. 10. XXXVI. 4. 23. 25. 29. XXXVIII. 30. 34. XLII. 34. XLIV. 7. XLV. 16. LXIX. 2. LXX. 7.
 Very large, XI. 11. XVI. 6. XX. 2. 30. 43. 51. XXII. 4. XXXVI. 11. 17. XXXVIII. 13. 18. XXXIX. 42. XLIII. 22. LII. 30.
 Very long, XLVII. 36. LII. 2.
 So long as to fill the left side of the belly almost universally, XXXVI. 17.
 Folded up into itself, LII. 30.
 Turgid with frothy blood, XXVII. 2.
 Spleen, somewhat rough on one surface with a kind of granules, XLVIII. 38.
 Having a whitish and thick crust on one surface, LVI. 17.
 Rough with a kind of miliary granules, XXVIII. 13. 34.
 With hydatids, XXXVIII. 34.
 Of a whitish colour, X. 13. XXI. 9. 30. XL. 23.
 Mark'd with white spots, IV. 24. V. 17.
 Of a pale colour, XXX. 7.
 Of a blueish colour, LXII. 5.
 Of a very dark colour, XI. 6.

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- Of a more livid colour than usual, XLII. 20.
 In one half of it, LIV. 26.
 Somewhat-black, XLVII. 12.
 Blackish with oblong spots, IV. 30.
 Black, XVII. 10. XVIII. 30. L. 48.
 LVI. 17.
 Very black on one surface, XXI. 17.
 Inclining to red, XX. 39.
 Red on one surface, XLVII. 36.
 LIX. 15.
 Inflam'd, XXXIV. 21.
 Partly affected with a gangrenous lividness, XXI. 29. 36. XXXIV. 11. 18. XXXV. 16.
 Affected with a sphacelus, XXXV. 14.
 Coat of, become thick, VII. 9.
 Hard in a part of it, VII. 11. XXIV. 18.
 Partly cartilaginous, VII. 9.
 Partly bony, X. 19. XL. 23. XLIX. 18.
 Spleen, lax, IV. 9. 16. 24. 26. VII. 9. X. 19. XIX. 58. XXI. 9. 30. 35. XXII. 8. XXIX. 20. XXXIV. 11. XL. 23. XLVII. 36. L. 48. LVI. 31. LXIX. 2.
 Very lax, XXI. 23. XXV. 10. XXVI. 31. XXVII. 28. XXXVI. 29. XLIII. 22. LII. 8. LIX. 15. LXVI. 6.
 Rather firmer than usual, LIV. 46.
 Harder than natural, XVIII. 25. 30. XXI. 49. XXII. 22. XXIII. 4.
 Very hard, XVII. 10. XXXVIII. 6.
 Spleen, internally pallid, XIX. 58. XXIX. 12. XLVIII. 38. LII. 30.
 Of a fleshy-colour, XLIV. 19. XLVIII. 37. LXIX. 2.
 Of a compact substance, and without blood, XXXVIII. 30.
 Having a pretty solid body within, XXXVI. 11.
 A spherical bone within the external part, XX. 41.
 Spleen; ligaments of, thicken'd, XLIX. 18.
 Vessels of, externally enlarg'd, XXXVI. 17. XXXIX. 42.
 Vein of, thicken'd, XXVII. 16.
 Artery of, scarcely inflected, XXXVI. 23. LIV. 37. LXVII. 11.
 Without any flexures at all, XLIV. 10. LXX. 7.
 Very tortuous, XL. 24.
 Wider than usual, XL. 22, 23, 24.
 More slender than usual, LIV. 37.
 At first more slender, and after that more wide, XLIX. 18.
 Having thicken'd coats, XL. 24.
 Cartilaginous coats, XX. 26.
 Having coats in some places bony, XL. 24.
 Almost every-where bony, XL. 22. See also Splenic artery.
 Splenic artery. See Spleen.
 With frequent bony laminæ with a bony diverticulum, III. 2.
 Spots of a purple colour, throughout the skin, IV. 9. X. 2. 7.
 Sternum, resembling the segment of a circle, IV. 16.
 Prominent about the middle outwardly, XLV. 23.
 Sternum, part of, internally black, as from contusion, LIII. 29.
 Parts of, consum'd by an aneurism, XVII. 25. XXVI. 9.
 Stomach, in an unusual situation, IV. 16. VI. 12. XVII. 25. XIX. 19. XXI. 24. XXIX. 12. XXXIV. 18. XLV. 16. XLVIII. 38. LII. 2. LVI. 12. LXVII. 11.
 Descending in a strait line from the diaphragm to the left os pubis, LXX. 5.
 Prolaps'd into the hypogastrium, XXXIX. 14.
 Drawn up within the thorax through a wound of the diaphragm, LIV. 10.
 Stomach, larger than it naturally is, XI. 6. XXIII. 4. XXVI. 13. 37. XXIX. 20. XXXVIII. 18. XL. 23. XLII. 11. XLIII. 22. XLVII. 18. XLVIII. 38. L. 9. LIII. 24. LV. 10. LVI. 12. LVII. 10. LX. 12. LXIV. 5. 19. LXVI. 9. LXIX. 2.
 Very long, XLVIII. 37. LXX. 5.
 Narrower than usual, XXXVIII. 30.
 Contracted,

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- Contracted, XVIII. 2. XXIV. 34.
XXIX. 14. XXX. 7. LV. 11.
LXII. 7.
Very much, XXXIV. 27. XXXIX.
33. XLVII. 8.
Very much distended, XXIX. 8.
XXXVIII. 22. XLVIII. 28.
44. LII. 30. LIV. 49.
Distended with air, V. 19. VIII. 25.
XVI. 4. XVII. 10. XXI. 24.
36. 44. XXIX. 8. XXXVI. 20.
LI. 50. LII. 8. LV. 10.
Stomach, figure of, not quite natural,
XXVII. 30.
More contracted and longer than
usual at the upper part, XXXIX.
14.
Narrower than usual in the middle,
XVI. 38. XXVI. 31. XXX. 7.
XXXVI. 2. XXXVII. 28.
XLVIII. 37.
Stomach, externally somewhat white,
XXXVIII. 16.
Livid, XXIX. 12. XXXIX. 29.
Blackish, XXXVIII. 30.
Red, livid, and black, in several
places, XXXIV. 25.
Suffus'd with a slight inflammatory
redness, VI. 8. XXIX. 8.
Of a preternatural colour, XXX. 4.
Of a brownish colour, LV. 11.
Having a very black spot, XXX.
16.
Affected with a gangrene, XXXV.
18.
With its vessels distended by blood,
VIII. 25. XXX. 4. LV. 10.
LIX. 12.
Artery of, dilated, XXIX. 20.
Surprisingly tortuous, XLIII. 24.
With a tubercle form'd upon it ex-
ternally, IV. 19.
With a scirrhous tuberosity annex'd
to it externally, XIX. 58.
With tubercles that were black by
reason of blood stagnating be-
neath, XXXV. 2.
Stomach, coats of, more lax than usual,
XXX. 14. XLIII. 22.
In some places half-corrupted, XXIX.
12.
Very thin, LV. 10. LVII. 10.
Thick and hard altogether, or
in part, XXIX. 6. 12. 14.
XXXIX. 25.
Near the pylorus, almost of a
bony hardness, LXX. 5.
Very deeply ting'd by the bile of
the gall bladder in that place,
XXX. 20.
Stomach, therein many worms, XLIII.
22.
A small quantity of bile, or a great
quantity, XVIII. 2. XX. 15.
Black bile, XLIX. 26.
Eruginous and poisonous bile, LIX.
18.
A blackish humour of a very offen-
sive smell, XXXIX. 26.
A humour very similar to ink, XXX.
16.
Of a green colour, or somewhat-
green, VIII. 25. LIX. 12.
Somewhat-livid, XXXIX. 29.
Ting'd with soot, as it were, XXIX.
6. XXX. 2.
Somewhat-thick, and of a cineri-
tious colour, VIII. 27.
Of a similar kind, but very
foetid, XXIX. 12.
Very similar to the white of an
egg, XXX. 20.
A great quantity of yellowish matter,
XXXIV. 9. 18.
Stomach, slightly red internally from in-
flammation, XXX. 7. LXVI.
9.
With inflammatory striae, XVIII.
2.
Beginning to be inflam'd, LIV. 37.
Inflam'd here-and-there in several
places, XXIX. 14.
Inflam'd, XXX. 4. LV. 11. LIX.
15.
Mark'd with bloody points in a cer-
tain place, XXV. 2. XXXVII.
2.
Having blood on its internal surface,
which might easily be press'd
out, XXIX. 18.
Many bloody, and some gangre-
nous spots, ibid.
Stomach, internally brown, livid, and
somewhat black, XXXIX. 26.
XL. 23. XLII. 13. XLIX. 14.
LXIV. 5. LXX. 5.
Having spots of a black and livid
colour, XXI. 30. XXX. 14.
Very small and gangrenous, XIV.
35.
Black,

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Black, and affected with a gangrene,
XXX. 16. XLIII. 22.
With many gangrenous erosions,
XXIX. 20.
With erosions whereto arsenic ad-
her'd, LIX. 3.
Eroded in a certain place, LV. 10.
Very slightly ulcerated, XIV. 35.
With an ulcer, LXV. 3.
Perforated by an ulcer, XXIX. 14.
Stomach, within it a tubercle, XXXVII.
30. XXXIX. 26.
A caruncle, XVI. 36.
Many glands, as it were, LXV.
3.
A cancerous tumour ulcerated,
XXX. 2.
A very bad kind of tumour rup-
tur'd, XXIX. 12.
Stomach, extenuated in a certain place,
XXV. 2.
Wanting the internal coat in a cer-
tain place, XLIII. 22.
Without any rugæ, XLII. 39. LV.
10.
With its rugæ harder than usual,
LIX. 12.
Stomach, left orifice of, very large,
XXXVII. 30.
Internally livid, and somewhat
black, XVIII. 2.
Right orifice of, or pylorus, larger
than usual, and having its ring
deficient in one-half of it, XXI.
15.
Hard and very narrow, XXIX. 6.
LXV. 3.
Callous, XXX. 14.
Having an excrescence in its ring,
LVI. 6.
Its ring somewhat tumid in two
places, XXXVII. 30.
With two glandular tubercles,
XXIX. 17.
Divided into two or three protu-
berances, as it were, LXX.
5.
Having scarcely any traces of a ring
remaining, LV. 10.
Stomach, wounded in the middle, LIV.
8.
Pierc'd through in the upper part,
LIV. 10.
Subclavian arteries, wider than naturally,
XLIII. 17. XLIX. 13.

Mark'd internally with beginning of
fifications, LXIV. 13.
One of them dilated at the first
division, XXIX. 20.
Aneurism of one of them, XXVI.
21.
Succenturiatus Ren. See Ren Succentu-
riatus.

T

TEMPORAL muscles, VII. 9.
One of them contus'd, LI. 50.
LII. 35.
Wholly suffus'd with blood, LI.
38.
Blackish from a great quantity of
stagnating blood, LII. 30.
And tumid, LXIX. 2.
Temporal artery, branch of, lacerated,
LI. 50.
Temporal bone. See Temporis Os.
Temporis Os, eroded on its surface by
pus, LI. 27.
Fissur'd quite to the tympanum auris,
LII. 30.
Broken in the meatus auditorius,
LII. 25.
Testes, coats of, become thick and white,
XLII. 28.
Tunica erythroides of, become
thicker than usual, XLIII. 17.
Vaginalis of, having its cavity en-
larg'd upwards, XLIII. 22.
And to a very great degree,
XLIII. 25.
Every-where grown to the testis,
VII. 11. XLII. 28.
Become more dense than usual,
XXI. 19.
Thicker, XLIII. 17. LXIV. 7.
Testes, tunica vaginalis of, full of serum,
XX. 24. 26. 27. XLIII. 24.
Much distended with a very yel-
low water, XLIII. 22.
Full of yellowish water, XXI. 19.
Containing much water, turbid, or
like a lixivium, XL. 22. LXIV.
7.
Containing more or less of a brown
water inclining to a yellow, or
similar to urine, or to the wash-
ings of flesh, or discolour'd,
XLI. 18. XLIII. 17. 19. 27.
28.
Containing

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- Containing limpid water, in which was a certain corpuscle, XLIII. 25.
- Testes, tunica albuginea of, become thicker than usual, XLIII. 28. LXIV. 7.
- Unequal with small tubercles, XLIII. 18. 28.
- Having a yellowish water betwixt its laminæ, XLIII. 31.
- Testes, sanguiferous vessels of. See Spermatic vessels, unusually large, XXI. 19.
- Testes, one of them surrounded everywhere by dilated veins, VII. 11.
- A flap of fat on one of them, XLIII. 22.
- A bony little body beneath one of them, VII. 11.
- Testes, a large hydatid lying upon each of them, and with what kind of fluid, IV. 30.
- Others of a less size lying thereon, VII. 11. XXI. 19. XLIII. 17. 18.
- A roundish corpuscle lying thereon, XXIV. 16. XL. 22. XLI. 18. XLII. 11. XLIII. 22. 24. 25. 27. LXIV. 7.
- A small reddish excrescence lying thereon, XLIII. 29.
- A small fimbria, or little hydatid hanging from each, XLIII. 17. 19.
- Testis, considerably larger than the other, XLIII. 25.
- Three times as large, XLII. 11.
- With its epididymis longer than usual, XLIII. 17. 22.
- Diminish'd in its size, XXIV. 16. XLIII. 24.
- Testis, canaliculi of, whereof it consists, more evident than usual, XXI. 19.
- Substance of, brown in its colour, and inclining to red, XXIV. 16.
- Chang'd into a compact body, VII. 11.
- Into a membranous body, II. 20.
- Testis, cancerous tumour of, continu'd to another which was in the mesentery, XXXIX. 2.
- Testes, purulent and blackish at the lower part, XLII. 28.
- Testis, epididymis of, very closely annex'd to the testis, LXIV. 7.
- Vas Deferens of. See Semen.
- Testes, in women. See Ovaria.
- Thigh-bone. See Femur.
- Thorax, cavity of, small, XIV. 27. XVI. 4.
- Very small, IV. 16.
- On one side only, XIII. 3.
- Thorax, within it water, IV. 28. 30. X. 2. XVIII. 6. 28. XX. 20. 43. XXI. 30. 49. XXIII. 8. XXIV. 18. XXIX. 20. XXXVIII. 10. 12, 13. 28. XL. 23. XLIII. 24. XLVII. 4. LIII. 16. LIV. 2. LXIX. 16.
- In one part only, or chiefly, IV. 35. X. 5. XI. 13. XXII. 14. 16. XXXVIII. 6. LI. 6. LIV. 49. LVI. 7.
- Much water, or a very great quantity, X. 11. XVI. 2. 4.
- In one part only, or chiefly, XVI. 19. 26. XVII. 6. XX. 33. XXII. 16. XXIII. 4. XXXVIII. 4. 16. L. 48. LXI. 5.
- Limpid water, XVI. 6. XVIII. 2. XX. 32. XXXVIII. 22.
- In one part only, XX. 30. 36.
- Water similar to cow's whey, XX. 47.
- In one part only, XX. 39.
- In great quantity, LIII. 14.
- With white concretions, like the white of an egg boil'd, XX. 36.
- White water in one part, XX. 7.
- In great quantity, XLV. 16.
- Water of the colour of urine, in considerable quantity, XXVI. 33.
- On one side particularly, LXIV. 5.
- Yellow, or yellowish water, XVI. 10. 28. XXIII. 6. XXVI. 9.
- On one side only, or chiefly, VII. 11. XVI. 38. XXIV. 34.
- With a kind of mucous pellicles, XVI. 25. XXI. 34. XXXVIII. 13. L. 4.
- Water inclining to a green or blue colour, LVI. 26.

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- In great quantity, XVI. 30. 34. 36. LII. 8.
- With jelly and membranes, as it were, XVI. 30. 38.
- In one part only, or chiefly, XXXVIII. 30. LVI. 26.
- Brown or turbid water, XXI. 24. 34. XXXVII. 30.
- In one side, XX. 2. 45. XXI. 30.
- In great quantity, with white concretions, XVI. 17.
- Water, with gelatinous concretions, XXX. 12.
- Water, with small membranes, as it were, swimming in it, or a kind of filaments in one part only, XVI. 12. 17. 40. XX. 30. XXII. 8. LII. 8.
- Saltish water on one side only, XVI. 14.
- Thorax, within it red, somewhat-bloody, or bloody water, IV. 26. XI. 11. XIV. 35. XVII. 23. XVIII. 8. XXI. 15. XXVI. 21. 31. 35. XXX. 10. LIV. 39.
- On one side, V. 11. VI. 12. XVII. 17. XXI. 3. XXII. 22. LII. 8.
- Blood, extravasated, XXI. 47. XXXI. 14. LIII. 33. LIV. 10.
- On one side only, XX. 17. IX. 4. XVII. 14. 17. XXVII. 28. XL. 29. LII. 35. LIII. 40.
- Blood, extravasated in great quantity, LII. 34.
- On one side only, XXVI. 3. 11. 29. LIII. 3. 5. 26. 29.
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T H E E N D.

But to pass over these things ; I certainly do not think you will be stagger'd by this consideration, that it does not seem probable the traces of so pernicious a bite should be so slight and obscure as the ancients have taught ; but rather be led thereby to inquire into the cause of this admirable circumstance, as they had even attempted to do in the time of *Ælianus* (r).

For they thought that this cause must be suppos'd to consist in "the surprising celerity" wherewith that poison "passes on to the internal parts:" by which means, externally, "there is nothing of a prominence or tumour ;" and for this reason," says he, "it was not easy for the party of *Octavius* to discover in what manner *Cleopatra* had brought about her own death ; till at length, after a long enquiry, they discern'd two punctures that were "difficult to be seen."

And if you chuse to illustrate this ancient thought by a recent explication ; you may so much the more easily make use of that which we have often made use of above, when we suppos'd the poison to attack the nerves, in proportion as it is more evident, that this happens from the poison which the asp inserts by its bite ; and which is call'd "soporiferous" by *Ovid*, as I have before related (s) ; as the asp itself is call'd "somniaferous" by *Lucan* (t) ; and with the same view, according to the opinion of the most learned men, by *Helvius Cinna* (u), *somniculosa* ; and expressly by *Solinus* (x) "hypnale :" and thus he explains it, "The hypnale kills by sleep, an instance of which we have in *Cleopatra*."

For in what manner ; unless you say that the efficacy of this most minute poison is carried to the brain very speedily, by means of the nerves ; will you explain the following things, which I will quote in the words of *Lucan* (y), when speaking to a person wounded by an asp :

*Nulloque dolore
Testatus morsus, subita caligine mortem
Accipis, & Stygias somno descendis ad umbras.
Non tam veloci corrumpunt pocula letbo ; &c.*

And I have us'd the words of more than one poet, not because, in regard to the somniferous poison of the asp, and of "the speedy dimness" from thence, as *Dioscorides* himself (z) says, the words of physicians were wanting ; but that you might perceive the efficacy of this poison to have been so commonly and certainly known to be hypnotic, as to be not only consider'd in that view by physicians, but even in the writings of poets also.

The brain, therefore, being so speedily and vehemently attack'd, it is not surprizing if the other parts of the body, which depend thereupon, are soon after depriv'd of their strength ; just as if an universal paralysis were brought on ; and, therefore, that the motion of the blood being instantly stopp'd, especially through the small subcutaneous branches, a redness, a lividness, or a tumour, can scarcely more shew themselves in the punctur'd part, than if a mere carcase were prick'd.

(r) C. 61. supra ad n. 38. cit.

(s) N. 37. (t) L. ibid. cit.

(u) Apud Gell. Noct. Attic. l. 9. c. 12.

(x) Polyhist. c. 29.

(y) L. cit.

(z) C. 54. cit.

And thus it seems, that where the most instant death follows the bite of an asp, the case may be explain'd: and, indeed, how speedy the effect of it was in Cleopatra, is manifest from those things that Plutarch (*a*) relates.

41. Aetius (*b*). you will say, has indeed asserted, that from one species of asps follows the "most instantaneous" death; but that from another species death follows only "in three hours at most:" nor are some wanting who assert it to be still more slow; and not to happen till after the body has become green and discolour'd.

And, indeed, the author of the book *De Theriaca* to Piso (*c*), although he confesses that asps "do really kill very speedily, as he frequently saw in " Alexandria the Great;" nevertheless, sufficiently shews, by immediately subjoining the following things, that the persons bitten do not immediately fall down therefrom: "For when they do not chuse to kill any criminal by " this kind of punishment without long torture and delay, they apply the " asps to their breasts, and make them walk about a little, and by this means " kill them in a short time."

And even Plutarch (*d*) relates, that one of the servant-maids of Cleopatra was found fitting the diadem to the queen's head, and not incapable of speaking. I grant it; but she was half-dead: and immediately fell down, after uttering a few, and almost inarticulate words.

Nor did they who walk'd about *a little while* fail, for that reason, to die *in a short time*, and *speedily*.

And if any persons dragg'd on their life to a longer extent of time, it is not at all surprizing that they should, at length, have their bodies discolour'd and green, for this very reason: but if this had been common to all thus bitten, the psylli would not have been made use of to Cleopatra; for her body being, as Plutarch relates (*e*), "neither deform'd, nor bearing any other " mark of poison," besides those two punctures, would have demonstrated that she had not been bitten by an asp.

But I have disputed of these things in such a manner, as if, where some hours have pass'd betwixt the envenom'd blow and death, it cannot possibly be otherwise, but that the place, whereby the poison is introduc'd, contracts a tumour and a lividness.

Yet certain instances are extant, which shew that, even after five or six hours have been interpos'd, no lividness or tumour has appear'd in the place; as in the pigeons which Redi (*f*) kill'd by the wounds of an African scorpion. And in the dog which the scorpion of Montpelier had wounded, and which died six hours after the stroke, the celebrated Maupertuis (*g*) found no tumour in the part where the wound had been receiv'd; whereas a tumour is generally the consequence of the puncture of a bee or of a wasp; but in the place where every stroke was given, he found a red point only: and he denies that he had ever seen it otherwise, in the great number of animals upon which he made the same experiment.

(a) Vit. cit.

(b) Tetrabibl. 4. S. 1. c. 20.

(c) C. 8. (d) Vit. cit.

(e) Ibid.

(f) Esper. int. agl. insecti.

(g) Comment. supra cit. ad n. 25.

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And to turn my discourse from the asp to an animal very similar thereto, that is, the viper; you know, for a certainty, from what I have said above (*b*), that in the whelp of Francini, no part of the body was livid, or tumid, even many hours after it had receiv'd the fatal bites from a viper; and that in the finger of a noble youth (*i*), which a viper had wounded, in such a manner as to produce the most violent symptoms, though with one tooth only, a tumour at length appear'd, after some hours; whereas to that very time, nothing could be distinguish'd but "a puncture not larger than" that which is made by a small needle: the foramen appearing very small "on the surface, and being attended with the slightest redness; so as to be" known by the colour alone."

And if it is sometimes no more from a viper, how much less will it be from an asp, the poison of which, by creeping on so speedily to the brain, does not leave time to the wounded part to be livid, and raise itself up into a tumour.

42. Now we are to see what Plutarch and Dio, if they are join'd with other authors besides, supply us with in order to defend the common opinion more easily. In the first place then, we have this from Plutarch (*k*), that Cleopatra, who was a woman neither of a stupid, nor a humble mind, having foreseen, before she came into the power of Augustus, what fate might await her; had resolv'd to die, rather than from a queen to become a slave, and be carried in triumph before the chariot of the victor.

With this view, that she had procur'd a great quantity of poisons, and had made experiments, with each of them, upon the bodies of criminals who had been capitally condemn'd: I mean, that she might choose out, for herself, a poison whereby she should die not only without pain, but very speedily; lest, if death should be slow in coming on, she might be compell'd to live, by the unwelcome assistance of remedies.

Which of all these, then, should we suppose she had selected? She would, without doubt, have rejected minerals, as being contrary to both these her wishes, if they had been us'd by way of poison at that time; which I do not ever remember to have read of; especially as those chymical artifices, whereby their powers are exasperated, and made more pernicious, were unknown.

The poisons in use were from vegetables and animals: nor was various art wanting to make them speedily fatal. One of these artifices we learn from Suetonius (*l*), when a poison, which kill'd within five hours, being, soon after, "boil'd and reboil'd frequently" by Locusta; I suppose that the much greater part of the aqueous particles being dissipated, the poisonous ones might be more crowded together; "became instantly fatal."

And although this poison; whether it consisted of the juices of vegetables, or animals, or of both; was probably known to Cleopatra, as that certainly was which was taken from animals, and made use of by savage nations to tinge their arrows; a poison of the same kind with that, among the Scythians,

(*b*) n. 34.

(*i*) Histor. ibid. indicata.

(*k*) Vita cit.

(*l*) De duodec. Cæsar. l. 6. c. 33.

mention'd by Pliny (*m*), "irremediable," as he says, "and bringing on death instantly by the slightest touch;" yet at the same time that she might approve the quickness of the death, she was averse to that very short, indeed, but very severe agony, the marks of which, I suppose, she would have known from violent convulsions; which I conjecture to have been the immediate consequences of that poison of Locusta, because Nero believ'd, that the deadly effect thereof might be conceal'd by a kind of epilepsy to which Britannicus was subject (*n*): and Mead (*o*) relates, that the water of Nichols, prepar'd from the lauro-cerasus, was very speedily fatal indeed; but not without violent convulsions: and finally, it appears from the experiments of Reaumur (*p*), that animals slightly prick'd with the points of arrows, when daub'd over with a certain poisonous composition, by the inhabitants of the coast of Maragonia, had died very soon indeed; but, as he particularly relates of a bear, that, before death, they had been shaken and agitated by convulsions.

For these, and other reasons similar thereto, I suppose, then, Plutarch related of Cleopatra, that, having first tried other poisons in vain; as they did not well answer both her intentions; she turn'd her thoughts to animals, as Dio also asserts (*q*): and after having tried animals likewise for many days, in vain, at length found that "the bite of the asp was almost the only poison" whereby she could have both her ends answer'd.

And if you attend to all these circumstances; you will easily understand why, rejecting other poisons which kill'd instantaneously; some of which she had at hand, as I shall show below (*r*); it is by far the most reasonable to suppose that she preferr'd the bite of the asp; especially as the other things that are said above of those two very small punctures, and of the psylli being applied (*s*), exactly agree therewith.

For as to a learned man, perhaps, seeming, to those who may read him with but little attention, to have thought of the psylli, as if they had been applied by Augustus, only through a kind of mockery; it is sufficient to inspect Suetonius (*t*), and Dio (*u*), in order to see plainly that it was done by Augustus, with intent that Cleopatra "might be sav'd to adorn his triumph, as he earnestly desir'd:" and that, after he saw she could not be sav'd by the psylli, "who suck'd out the poison and the virus, he griev'd exceedingly; thinking himself depriv'd of all the glory of his triumph."

And if he who was immediately present, and inspected the body, and by means of his power and ingenuity could examine into every circumstance, and make every necessary enquiry, suppos'd her to have been kill'd by the bite of an asp, as Plutarch (*x*) relates; "for in the triumph he bore the image of Cleopatra, having an asp fix'd to her by its teeth;" why should we

(*m*) Nat. Hist. l. 11. c. 33.

(*n*) Vid. Tacit. Annal. l. 13.

(*o*) in Append. post Tentam. 5. de Venen.

(*p*) Hist. de l' Acad. R. des Sc. A. 1747. Obs. Anat. 1.

(*q*) l. 51. cit.

(*r*) n. 44.

(*s*) n. 40.

(*t*) c. 17. cit. supra ad n. 39.

(*u*) l. 51. cit.

(*x*) Vita cit.

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not believe what he believ'd? especially as other corroborating circumstances are moreover added, which we shall immediately produce from the same Plutarch, from Dio, and others, even medical authors.

43. For what is to be argued from the circumstance related by Plutarch (y) for a certainty; I mean, that on the same day whereon Cleopatra died, and even a few hours before her death, a box was brought to her out of the fields, "full of figs, and cover'd with leaves," but that which he tells us was afterwards said, that the asp had been hidden in the box?

And this Dio (z) also relates from others; although he says, "that an asp was brought in an urn, or among some flowers;" and the author of the book *De Theriaca* (a), that it was "cover'd over with figs and grapes." And while I attend to these relations, I seem able, at the same time, to conjecture what species of asp it was.

For as they have asserted that there are three species (b); calling some ptyades, others terrestres, and others chelidoniæ; and have said that those of the first species were "of the length of two cubits," the second sometimes "of the length of five cubits," and that the third species were found to be only "a little longer than a cubit;" these last, not only as more easily to be found; having their lurking-places about the banks of rivers, "and especially about the Nile," which was so near; and in like manner as bringing on a more speedy death than the others; for from the bite of these "the most instantaneous death comes on;" and not only these circumstances, but being much more easily conceal'd under flowers and leaves, by reason of their shortness; these last, I say, I do not doubt were more convenient for Cleopatra, and particularly more proper to deceive those who kept guard at the gate.

And herewith agrees the very ancient and learned artist of the Vatican statue, who, not only very skilfully express'd the dying Cleopatra as if in a placid sleep, but also plac'd upon her arm a short asp, and that on the left arm; having, I suppose, taken this idea from some ancient writer, from whom Orosius (c) likewise, otherwise an historian of the fifth century, seems to have taken it.

But whether the affair was manag'd in this manner, or, as others, spoken of by the same Plutarch (d), related, "the asp was kept shut up in a certain vessel, and brought forth by Cleopatra through a golden pipe;" either one or the other relation has a final tendency to prove that she suffer'd herself to be bitten by an asp.

You see then, that what has been related by Plutarch, and others, agree with the things that have been asserted by Vellejus and several authors spoken of in the beginning. And the author of the book *De Theriaca* (e), whom I mention'd before, sufficiently shows that the same opinion was the most probable to him. And whether this author was Galen, or some other, at least, who was cotemporary with Galen; as he says (f), that Androma-

(y) Ibid.

(z) l. 51. cit.

(a) c. 8.

(b) Vid. Aetii c. 20. supra. ad. n. 41. cit.

(c) Historiar. l. 6. c. 17.

(d) Vita cit.

(e) c. cit.

(f) c. 5.

chus " was not many years before him," and " that Marcus Antoninus " had, some little time before, govern'd the Roman empire with the greatest " integrity " (*g*); he is not to be despis'd by us: since, if you consider his age, he was neither younger than Dio, nor finally, a great deal later than Plutarch; for it is certain, not only that Plutarch liv'd during the reign of the emperor Hadrian, but that Galen was born at that time; and if you attend to experience, he alone of all those authors that I have quoted above, expressly says, as you have read just now (*b*), that he had often seen, at Alexandria, in what manner, and how speedily, asps kill when applied to the body.

Nor because he says, that Cleopatra had made use of one of those call'd pytades; which, however, I do not find to be asserted by any one of the older authors; will you suppose that she wish'd to do it for this reason, that she might be spit upon by the pytades; for from thence " death follows very slowly," as is asserted by Aetius (*i*); but that she might be bitten: for this kind of asp bites, as the same author subjoins; and by biting, as Galen says in Paulus (*k*), " brings on the most speedy " death."

And indeed, unless Paulus had his eye to some other passage of Galen, in the books that have been lost; he must have consider'd this very book *De Theriaca*, as one of Galen's; and have taken from thence what he speaks of as said by Galen: I mean, these three kinds of asps, and the ingenuity of the pytades, in reaching by his spittle persons at a distance from him; and Cleopatra killing herself therewith. For these things are said in both places.

But as to its being said in the book *De Theriaca*, that the queen had made use of a pytades to kill herself, this Paulus has suppos'd, with great justice and propriety, is to be understood of the bite; for it was by no means necessary to apply it to her body, in order to be spit upon by it, as it was accustomed to spit afar off.

And as to those things that are soon after subjoin'd, in that same book, of the speedy death of condemn'd criminals, by applying an asp to the breast; perhaps Paulus, thinking that these circumstances were to be connected with the former, brought in Galen as leading to the licence of the painters and statuaries; as if he had said, that the queen " had applied to her left breast " an asp of the pytades kind, and had been destroy'd by the bite of that " animal."

But we are prevented from believing this by Plutarch and Dio, who deny, as we have seen above (*l*), that there appear'd any mark of poison in her body after death; except two very small punctures in her arm. And this circumstance is also sufficient to show us, that it was not without reason the same author of the book *De Theriaca*, in relating a different narration of some other persons, did it in such words as show'd himself to be not at all satisfied therewith: a narration, that is to say, " of a large and deep wound," which

(*g*) c. 2.(*b*) n. 41.(*i*) c. 20. cit.(*k*) De Re Med. l. 5. c. 18.(*l*) n. 40. 41.

Cleopatra “ made upon her arm with her teeth ; and of poison which she
 “ had previously procur’d from the asp, being brought to her in a certain
 “ box, and infus’d into that wound ” soon after.

44. But those very small punctures in the arm, as they disprove the report of a large and deep wound in the arm ; so they exceedingly well agree, you will say, with another narration, which is extant in Dio (*m*), though not in the author of the same book : I mean, that Cleopatra had taken the needle, or bodkin, which she was wont to pin up her hair with, and wear constantly therein, from her head ; and after having daub’d it over with the most virulent poison, had prick’d her own arm with it.

But I would have you read Redi (*n*), where he admonishes you, in consequence of his own experiments, that if the wound you make be narrow, it is difficult to introduce the poison : and whatever the wound may be, that the animal does not die so soon after having the poison of the viper injected into the wound already made, as after the bite of the viper itself.

And after these considerations, can you suppose, that she who wish’d the most certain, and most speedy death, would have made use of an uncertain and less speedy method of dying ? And yet our disputation was not of poison being thus introduc’d, but chiefly of poison being drunk.

And as there is no-where any mention made of that, as I have said above (*o*), in so many narrations ; lest you should happen to think that this passage of Plutarch (*p*) may be suppos’d to refer thereto : “ It was found that
 “ Cleopatra had poison in a kind of hollow plate which she conceal’d under
 “ her hair ; ” and lest you should suspect it to have been that, or similar thereto, wherewith she, having smear’d over the flowers of her banquetting garland, and thrown them soon after into a bowl, “ had commanded a person brought out of prison to drink thereof, who instantly expir’d ; ” as you have it in Pliny (*q*) ; or of the same nature with that, which, not many *lustra* after the death of that queen, was sent from Alexandria to Jerusalem to kill Herod ; as Josephus (*r*) has said ; that is, the virus of asps, and the “ poisonous juices of other serpents,” by the drinking of which poison “ a criminal capitally condemn’d died immediately ; ” lest then, I say, you should suspect these things, I will not produce this passage from the same Pliny (*s*) : that the poison of asps, “ when drunk in the largest quantity, is “ not hurtful. For there is no contagious efficacy therein : so that the animals kill’d by the bite of this creature, are not improper for food ; ” which things agree with the experiments of Redi, and others, upon the viperine poison (*t*) : nor will I say the other things in general, which I have hinted at in my second letter to Lancisi, from whence you may conjecture that this poison rather related to that wherewith Dio has said the hair-needle, or bodkin, was besmear’d ; that is to say, one which was not injurious, as he openly asserted, except introduc’d into a wound.

I will only add one thing from the same Dio and Plutarch, from whence you may very clearly and instantly perceive, that Cleopatra did not die from

(*m*) l. 51. cit.

(*n*) Lett. int. alle Opposiz.

(*o*) n. 38. (*p*) Vita cit.

(*q*) Nat. Hist. l. 21. c. 3.

(*r*) De Bello Jud. l. 1.

(*s*) Nat. Hist. l. 29. c. 4. (*t*) *supra*, n. 30.

the taking of poison, which she carried in a hollow plate under her hair.

For Dio (*u*) relates, as fact, that before she kill'd herself, she gave to Epaphroditus, to whom the custody of her was committed, a letter to be carried to Augustus, that he "being remov'd from his post, under the pretence of sending a letter to Augustus, she might have opportunity to execute what she had propos'd."

Plutarch (*x*) likewise had asserted without any doubt, that the queen, when about to kill herself, had given a letter to be carried to Augustus, "and having dismissed all her attendants, but two women, had shut the gate." To what purpose was it then, I pray you, that she should send away Epaphroditus, and the other attendants, from about her, and shut the gate, in order to take poison from that hollow plate?

She, therefore, must have intended to do something else which she could not do without the removal of all witnesses, who would have prevented it: that is to say, she intended "to handle fierce serpents, in order to drink the black poison from them, by her body," as Horace (*y*) says, and not by her mouth.

And the testimony of this author I consider as of very great weight, not only for other reasons which I have hinted at in the letters sent to Lancisi; but, in particular, for this reason, that he, to use the words of the younger Pliny (*z*), "has follow'd the relations which were made of the fact immediately after its transaction; at which time they have generally the most truth in them."

45. Do you think, then, it was any-thing else but the handling of the asps which Cleopatra could do, and perhaps did, when all her attendants were remov'd, in order to afford her an opportunity of killing herself with poison? When I had written thus far, I accidentally lit on a passage of a Greek author, and a cotemporary of Vellejus, which I think should not be omitted in this controversy.

For Strabo (*a*) has said the following things: "Cleopatra kill'd herself by applying, privately, the bite of an asp; or with a poison smear'd over her; for it is said in both ways."

It appears, therefore, that, if she was determin'd to anoint her body with this poison, she ought to have shut the gate before, and kept no-body but her maids about her.

But before you say this, read Plutarch (*b*). You will see that, on this day, the queen, having made use of the bath, might have anointed her body with what ointment she pleas'd, as the custom was then, without any one being surpriz'd at it, or prohibiting it: that, after this, she din'd, and magnificently too, (from whence you might draw a new argument, that, therefore, she had not determin'd to kill herself soon after by swallowing or drinking down poison; as, by means of having made so many experiments, she could not be ignorant how far food, previously taken in, may either prevent or

(*u*) L. cit. 51.

(*x*) Vita cit.

(*y*) Carm. l. 1. Od. 37.

(*z*) L. 6. Epist. 16.

(*a*) De situ Orbis, l. 17.

(*b*) Vita cit.

retard the effects of poison that is swallow'd (c) : that, while she was at dinner, the box, full of grapes and figs, was brought in, together with the asp ; as she seems previously to have order'd : and then, finally, that she deliver'd the letters directed to Cæsar, and, all witnesses being remov'd, shut the gate.

You therefore perceive, from this very series of things, whether it is most probable that she kill'd herself by a poisonous ointment, or by an asp.

Add to this, that Epaphroditus, who kept her so cautiously and attentively, as immediately " to take off the upper garment " of his prisoner, " lest she " should have conceal'd any poison underneath ;" as Plutarch has asserted above ; would certainly not have left her boxes of ointment without a diligent examination and strict enquiry : or, what was much more ready and safe, would have chang'd them for others fill'd with innocent ointments, of whatever price they might be ; since Augustus had given this charge to him, " That he should, above all things, take care she might not have it in her " power to kill herself : but as to every thing else, that she should be quite " at her liberty."

One thing only, therefore, remains for you to conjecture ; I mean, that there was but a little of that poisonous ointment, so that it could " be " hid under the hair in that hollow plate " which has been spoken of above (d).

For thus, also, " in Martina ; famous for the preparing of poisons ; who " died of a sudden death at Brundisium," while she was brought to Rome as an accus'd person (as we read in Tacitus (e)) ; " poison was hid in the " knot of her hair, nor were any marks of the poison she had taken found " upon her body."

Yet if you should make this conjecture, the argument then returns that was brought above (f) in opposition to the opinion of those who contended, that the poison wherewith Cleopatra had kill'd herself, by swallowing, was included in that plate.

For as a little ointment was not sufficient to anoint the whole body all over, but only certain parts ; as, for instance, the nostrils, and other similar parts ; to what purpose was it to shut the gates or doors, in the mean time, and to remove all witnesses, in order to do what she might have done in the night, when she appear'd to be asleep : and that without the suspicion of any one ?

And to this we might add a great number of other arguments, which it is not necessary to repeat, and which do not at all agree with the suppos'd ointment ; but agree perfectly well with the bite of the asp ; as the application of the psylli, the two punctures observ'd in the arm, and other things : among which are the very ancient statues and images, whereto some respect must be paid ; and, in particular, that which gave the first occasion to the dispute, in which the asp is tied to the arm, in such a manner as to seem to be irritated and provok'd to bite by the very constriction of the bandage.

(c) Vid. *supra*, n. 10.

(d) N. 44.

(e) *Annal.* l. 3.

(f) N. 44.

Nor let it stagger you that it has been objected hereto, that no-body dare tie an asp to the arm of another, lest the asp should bite the person who binds it rather than the other's arm. For what else did those two servant-maids desire, but to die by the same fate as their mistress? following the example of the eunuch their colleague, who, as Dio(*g*) relates, "voluntarily expos'd himself to be bitten by serpents," as soon as ever the queen was taken prisoner.

And as to the other arguments; taken from the soft and timorous minds of women, or from the supposition of one asp not being sufficient to kill three women by its bite; and any other objections that might be drawn from Redi, or elsewhere; I think I have pretty well overcome them, either in the letters before publish'd, or in the present letter.

46. And thus far I had to add to those same letters: not that you should prefer what I have now written to the things said on the contrary side of the question by that illustrious man, and in an ingenious and learned manner; but that, by comparing both of the disputations together, it might be the more easy for you to distinguish whether I have stood up for that part of the question, in this controversy, which, at least, does not stand greatly wide of probability.

And although this point of itself is not of any great moment; yet, by reason of the several quotations that I have been under a necessity of making on account of it; not only from historical, but from medical authorities, and even from other sources; it has, I hope, lessen'd the irksomeness of long reading to you, to whom it may be, perhaps, in some measure useful: or, at least, it has alleviated to me this last labour of writing; so that I think myself at liberty to conclude my treatise to you on this subject almost in the same words as the author of the book *De Theriaca* (*b*), whom I have often commended, finishes his narration to Piso upon the death of Cleopatra: "I have treated of this subject with a secret pleasure of mind, that I might be able to satisfy that desire which you have after all learning." Farewel.

(*g*) L. 51. cit.

(*b*) C. 8.

END of the FOURTH BOOK.

THE
SEATS and CAUSES
OF
DISEASES
INVESTIGATED BY ANATOMY.
BOOK the FIFTH,

Wherein many Things are added by way of Supplement
to the four preceding Books.

LETTER the SIXTIETH

Relates to the Apoplexy.

1. **I** THOUGHT I had already done more than was requisite; and, as I did not scruple to say in the conclusion of my last letter, had put the finishing hand to my labour on these subjects.

But behold! your letter is come to hand, wherein you thank me in such a manner as, at the same time, pretty plainly to shew that you expect those observations of mine which it was impossible for me to insert in their several proper places; as they have been made since the respective letters to which they belong were finish'd: and that this is very well understood by you, not only because you know that I examine many different dead bodies every year, but also because you have not receiv'd as yet some of the observations of this kind which I have now-and-then promis'd you as I was writing.

What can I say? You have certainly a right to insist upon what you ask; particularly from a man who, unless you would of your own accord release him, is a very punctual observer of his promises.

I beg therefore, at least, that you will receive these observations with the same candour that you have receiv'd the former: and I will add as many as I am able; beginning with disorders of the brain, and in preference to others, with the most violent of them all, the apoplexy.

2. An old man had died apoplectic, in the hospital at Padua, about the beginning of December, in the year 1744; at which time I was there demonstrating some parts of the human body, to the young gentlemen who studied there.

I made a diligent enquiry into a number of circumstances, according to my usual custom, but could learn no more than these; that having been seiz'd with an apoplexy, thirty days before, he was at length brought into that place, without any sense or motion; his eyes being red to a very great degree.

While the assistants were cutting into the cranium, I happen'd to be looking upon the thoracic viscera, which were just taken out; and in the upper part of the right lobe of the lungs, observ'd a hardness, such as is wont to be left after an old disease. And therein was contain'd a small tubercle, in which was a purulent matter.

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The heart contain'd polypous concretions, and afforded no appearance worthy of remark ; except that the aggeres, or tubercles, of the semilunar valves, were become very thick, and of a white colour.

These viscera being then remov'd, I, in the mean while, turn'd my hands and eyes to the laying open, and examination of the brain. And having taken off the exterior of the meninges, one difference appear'd betwixt the left and the right hemisphere of the brain, which consisted in this ; that the posterior surface of the latter seem'd to be black, and very red in the middle.

The blackness was owing to the vessels, which creep through the pia mater, being there distended with black blood, to a very great degree ; and the redness was owing to blood, which, being extravasated betwixt those vessels, as if by exsudation, seem'd to have occupied the spaces interpos'd to the vessels, by a very thin kind of crust : or rather, as we could not in fact find any extravasated blood there, it was owing to the blood stuffing up all those small vessels, which lie so exceedingly thick in this membrane.

Then on opening the lateral ventricles, in both of them, equally, was seen a very bloody serum, to the quantity, perhaps, of one drachm, occupying only the anterior part ; the plexus choroides, on both sides, being pale, and the septum lucidum entire.

The left hemisphere also was found, both internally and externally ; and every other part within the cranium was tolerably found, except the right hemisphere alone.

For within the medullary substance of this hemisphere was a cavity, which had almost a middle situation in respect to all the different regions of the hemisphere ; being at least five inches long, two and a half in breadth, and as many in depth ; very full of black blood, which was partly fluid, but partly, likewise, concreted into coagula.

And, this coagulated blood being taken away, the parietes of the cavity appear'd to be very disagreeably lacerated, and unequal.

The substance which lay round about them was very lax : and not only that which made up the medullary part, but that which went to compose the external side of the whole corpus striatum, and the whole thalamus nervi optici ; and that, also, which made up some part of the neighbouring basis of both those protuberances.

3. As I have already explain'd to you, in a former letter (a), how a cavity of this kind seems to be form'd in the cerebrum ; and how fatal it is when in the neighbourhood of those protuberances ; there is no occasion to repeat the explication here.

You will rather ask this question of me ; I mean, how it was possible for a man to live so long as thirty days, with so great a disease of the brain ; and in such a part ? But do not imagine that this was the state of the parts, from the first attack of the apoplexy.

It is much more probable, that a small quantity of blood, distilling from some small internal vessel, which was ruptur'd, had then begun to prepare

that cavity for itself; and did not immediately enlarge it to that dilated state wherein we found it: but that, moreover, by distilling gradually more and more, it had gradually, also, dilated the cavern to that extent, till a great number of the canals, through which the animal spirits circulate, being ruptur'd; and many other compress'd by the increas'd weight and bulk; it at length took away all external sense and motion; and last of all the internal sense and motion also; whereby death was brought on: or, you may conceive, as I should more readily suppose, that, a new impulse being added from some cause or other, and many small vessels being broken at the same time, these last effects, which I have mention'd, were brought on by a sudden and large eruption, not a very long time before.

But in whichever of these two modes you chuse to explain the disorder, it will be very easy for you, not only to solve your own enquiry, but also to understand clearly, how useful it may be, when certain symptoms, which threaten a sanguineous apoplexy, first exist, to diminish the quantity of aliments; especially those that abound with acrid and thin particles; to abstain from too great motions of the mind and body, and to draw away blood; and where such an apoplexy has already come on, so much the more to diminish its quantity, and, as I think I have written to you before, to avoid such remedies as may too much move and agitate, in an untimely manner; those remedies, for instance, that are pregnant with volatile corpuscles; that produce vomiting, sneezing, and other effects of that nature.

4. A husbandman, of a middle age, and rather fat, was brought into the same hospital, in the year 1748, when I was teaching anatomy there; he having been seiz'd with an apoplexy, which was said to be the third, and was, in fact, so violent, that being immediately taken into the hospital, from the road wherein he had fallen down, not far from the hospital, he had already a stertor, and was paralytic in his whole body; so as not to give the least sign of sense or motion in any part: and his pulse being very small, so that they did not dare to take any blood away, he died within seven or eight hours.

On the fourth day after, all these circumstances were related to me; and, at the same time, the body was offer'd for dissection.

But before I would touch the carcase, I enquir'd, though to no purpose, at what time, with what preceding causes, with what concomitant signs, or remaining injuries, those two foregoing apoplexies, which were mention'd, had been observ'd; or what marks of disease they had left behind them: for I could learn nothing in respect to them, and of this last only what I have mention'd.

However, when I saw that the vessels about the head were turgid, and heard that there had been so violent an apoplexy, in a body rather fat; I made no scruple to say, to a very crowded circle of students, that it would be surprizing if I did not shew this to have been from a sanguineous cause.

The skull, therefore, being immeniatly open'd; when this was done, and still more when the brain was taken out; a considerable quantity of black blood flow'd down: and it was even evident, that it flow'd out from the infundibulum.

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The same kind of blood had not only distended all the vessels that pass'd through the pia mater, where it invested the cerebrum and cerebellum, but also under this membrane, in the middle of the left hemisphere, a small quantity was extravasated : and a great quantity in all the ventricles.

For as to the lateral ventricles ; besides a coagulum, which seem'd to be equal to two, not to say three, ounces in weight ; almost all the remaining part of those ventricles, and, moreover, the third and fourth ventricle, were occupied thereby.

When I came to enquire from whence it had been discharg'd, I found the case as follows. The posterior surface of the left ventricle, and of the thalamus therein, that is, the thalamus nervi optici, discover'd laceration by their inequality : and this was still much more apparent from the surface of the right ventricle ; inasmuch as it was not only every where unequal, but, moreover, preserv'd scarcely any traces of its thalamus, and none at all of the corpus striatum ; the seat of which was possess'd by a kind of lurid substance, of a colour that consisted of a somewhat red and yellowish hue, mix'd together as it were : being quite corrupted, but without any very disagreeable smell.

The cavity of both the ventricles was enlarg'd ; the septum lucidum was broken through ; there was no trace of the formix remaining ; scarcely any of the plexus choroides, and that of the left only ; the vessels being not turgid, but pale.

This, however, could not be at all consider'd as surprizing, where there had been so great a quantity of blood extravasated as I have said ; and where so large a coagulum had been form'd from thence, as that which had occupied the right and the left part of the cavity ; but the latter more than the former.

By reason of that considerable effusion of blood therefore, I did not wonder even at this circumstance ; I mean, that the sides of the third ventricle did not appear so perspicuously, whether they had subsided from compression, or from distraction, or even from laceration ; for the neighbouring surface also of the nates, and testes, was so lacerated, that these protuberances could not be distinguish'd.

To these preternatural appearances, which were seen in the head, two remain to be added ; to wit, that the left vertebral artery was somewhat hard, thick, and white, in one half of it, before it open'd into the basilar artery : and that the greater part of the posterior and inferior dentes molares, were either become mere stumps, and black even in their very roots ; as was the case on the right side ; or had quite fallen out ; as on the left side ; and that not a very short time before : for there did not remain the least traces of sockets ; and even the bony body of the maxilla had already contracted itself in that part, and subsided.

And, not to disjoin from the head its bony fulcrum, and the cavity of the cranium which is produc'd thereinto ; when I examin'd all the vertebræ of the neck, and many of the thorax, and inspected the included spinal marrow, I saw betwixt this and the pia mater, as it is call'd, at least in the superior vertebræ of the thorax, blood extravasated in a considerable quantity ; and this on the posterior surface ; and on the same surface the pia mater had

had so much red mix'd with a flesh colour, that you could not distinguish any blood-vessel therein, from the head almost to the middle of the thorax: whereas, on the anterior surface, the artery which pass'd singly through the middle, was seen to be distended with blood.

And even the dura mater, where it invest'd the internal sides of the vertebræ, was, in a manner, black from stagnating blood.

The thorax; which, as well as some of the parts before spoken of, I examin'd on the following days; contain'd a heart, which, in proportion to the man, who was pretty fat, was not at all fat; but, together with a small quantity of black and coagulated blood, contain'd a few small polypous concretions: yet those in the right ventricle were somewhat the largest; so that one of them enter'd into the pulmonary artery.

The substance of the heart was very lax. The coronary vein, where it goes round the basis of the heart, on the posterior part, was wider than it naturally is: the pulmonary artery itself indeed was not wider than it naturally is; but was seen to have very thin parietes, and thin valves also: but the left sinus of the heart, where it receiv'd the venous branches from the lungs, was very much enlarg'd.

The lower edge of one of the valvulæ mitrales was thicken'd to a considerable degree: and bony concretions, not of a large size, but pretty thick, had been form'd upon the aggeres, or tubercles, of the semilunar valves.

Yet the great artery itself was sound, quite to that part from whence it sent forth the left subclavian. But from thence it began to show white spots, pretty frequently, on its internal surface, and particularly on its posterior surface: some of which, and especially the first, had degenerated into a bony scale.

That first answer'd to the canalis arteriosus, which formerly open'd there; but was now according to custom shut up; except that in this man, by way of rare instance, I saw the orifice of that canal gaping in the pulmonary artery, from whence it begins; so that I could introduce a probe to the extent of half a line of Bologna.

In the belly I observ'd the following preternatural appearances. The surface of both kidneys was in a manner tuberos; but in a slight degree: that one of them, moreover, had subsided in a certain place; which place was circumscrib'd by the circumference of a circle, the diameter of which was equal to an inch: the substance of the kidney beneath was somewhat hard in that part, but only to an inconsiderable depth.

Both the iliac arteries were tortuous: and, to speak thus, varicose, almost like the splenic artery: in the left I saw a bony lamella. The other parts that I examin'd in this body were in a natural state.

5. From whence so great a quantity of blood had, for the chief part, burst into the lateral ventricles of the brain, is shown by the almost universal destruction of the plexus choroides; the vessels whereof had probably been ruptur'd suddenly, here and there, after having been considerably dilated.

I said for the chief part; for it must have been that other vessels also, which pass through the surfaces of the lateral ventricles, were lacerated likewise,

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wife, in the laceration of these ventricles; which was effected not only by the impetus, but also by the distracting quantity of the blood, flowing out from the plexusses.

But it is probable, that the greater part of the blood had come out of the vessels on the right side; for on the right side, we saw all the surfaces lacerated, and the whole plexus consum'd.

Nor would I have you think it unfavourable to such a supposition, that this large coagulum of blood was more on the left side than the right; since I apprehend the very contrary.

For as the first, and larger, resolution is generally brought on, in the side of the body which is oppos'd to the most injur'd hemisphere of the brain; it is very natural to suppose that the man fell down towards the left side (*b*); and that, for this reason, the larger quantity of blood had flow'd from the right ventricle into the left, through the rupture of the septum lucidum.

And that he fell on the left side, appears also from this circumstance, that the blood effus'd under the pia mater was in a part of the left hemisphere, and not in the right.

And of the right there was the greatest injury in this respect also, that instead of the corpus striatum, it had a mucous substance. A change of which kind in the substance of the brain, I have already told you (*c*), I had found more than once.

But as to the question whether the apoplexies, two of which had preceded, had in part been the cause of this change; or whether the dilatation of the vessels, or some certain parts of the brain, being render'd more lax, were the effects of those apoplexies; as we cannot certainly determine it; it is better to pass on to the third history of the sanguineous apoplexy.

6. A fat woman, of eighty-five years of age, who, as far back as her acquaintance could remember, had been always lame; and who, having been formerly married, had brought forth twenty children; had been seiz'd with an apoplectic paroxysm; first in the last summer, and with a second, ten days before she was carried off by the third.

All of these paroxysms began in the same way, and had a vomiting precede them. But the two first were solv'd in a short time, without any remedies; and without leaving any paralysis behind. Yet this last of the attacks, carried her off within fourteen hours; she being brought into the hospital without any sense or motion; if you except the respiration and the pulse; the latter of which was without any disorder, and resisted the fingers when press'd upon it: and the respiration rais'd up the chest and the belly alternately, without any stertor.

On the first of February, in the year 1754, when I had already demonstrated almost all the abdominal viscera from another subject; I afterwards began to make use of this, in order to finish the anatomical demonstrations.

In the belly, I observ'd these preternatural appearances. The trunks of the large vessels both seem'd to be wider than natural; especially as it was in a woman. And if you ascribe this to the number of utero-gestations; yet

(b) Vid. Epist. 2. n. 25. & Epist. 3. n. 14.

(c) Epist. 9. n. 16. & seqq.

you certainly will not refer thereto the beginnings of ossification ; and even the bony scales ; wherewith the aorta, and the iliacs, that arise from thence, and the two branches into which each of these iliacs are divided, were distinguish'd here and there, on their internal surface.

And if we say these appearances were the effects of age ; we shall say that the disease is a disease of old age.

But certainly, that disorder form'd upon the left kidney, which I remember to have promis'd you, heretofore (*d*), the explanation of, in the history of a certain old woman, who was the present, was neither the effect of old age, nor of utero-gestation.

That kidney might seem, at first sight, to be immoderately long. But fixing the eyes a little more attentively, we could see water within it, which, by being confin'd there, increas'd its length.

The judgment of the eyes was confirm'd by the touch ; and still more by the dissection soon after. For by cutting into the kidney, a yellowish water was discharg'd ; which, when receiv'd in a vessel, seem'd to all who were present, to be equal to the weight of four ounces.

This water having been under the proper coat of the kidney, where it invests the upper extremity of that viscus, had expanded it upwards in that manner ; so as to form the appearance of a produc'd kidney. The expanded coat was become much thicken'd, and had, internally, the appearance of protuberating plicæ, or folds ; and a kind of firm bands, but irregularly plac'd.

Both of the testes had spherules almost of the diameter of a double line of Bologna ; internally hollow, but quite empty ; the parietes of which, being of a white colour, both internally and externally, were pretty thick ; and so firm, that in one spherule in particular, which protuberated outwards, they seem'd bony : although they were in fact only of a middle firmness betwixt that of a cartilage and that of a nerve.

In the thorax the lungs were found to be sound ; notwithstanding the right lobe adher'd to the side, and in the bronchiæ was a great quantity of thick, though at the same time sufficiently fluid, matter.

In the heart every thing was natural ; if you except one of the semilunar valves, a part of the upper border of which, near to the *agger* or tubercle, was already almost bony. Yet some neighbouring part of the great artery ; for the other part which is in the thorax I did not dissect ; had nothing at all bony.

The centrum nerveum, or tendineum, of the diaphragm, as it is call'd, had neither the figure it generally has, nor the size ; and it was pierc'd thro', not with one foramen, but with three : this appearance, however, I have seen before (*e*), and that more than once ; two of the lesser foramina, for instance, which were contiguous to the larger, being form'd for the transmitting of two veins from the liver ; but if these veins had open'd into the trunk of the cava below the diaphragm, as they generally do ; and not above it, as they did in this case ; there would not have been three foramina in that tendon, but one only.

The upper limbs also had something peculiar in them. For having observ'd the longus palmaris muscle, in the right arm, not to be thick and fleshy, as it generally is at its origin, but to be thin and slender even there, and almost tendinous; and seeing the same muscle, when laid bare in the left hand, to be twice as thick as the right; having a greater quantity of flesh, and this going much farther down; and suspecting what was the effect of this difference, and what in part had been the cause; I order'd somebody to make enquiry, from the acquaintance of the old woman, whether she had been accusom'd to use her left hand instead of her right: and I was assur'd that this had really been the case.

However, to this question relate, still more, the appearances which I found in the lower limbs of this lame woman. She had been lame on the right side: nor could the cause be referr'd to luxation, as there was none at all; nor to the acetabula; as, when compar'd one with another, they show'd no difference, either in their situation, their position, or their depth.

But if you compar'd the bones of the thighs one with another, there appear'd an evident difference betwixt both; from whence you might conceive, that the right limb must, of course, be shorter than the left, as it really was.

For the os femoris on the right side, was so much shorter than the left, that, if you plac'd them both near to each other, the upper part of the head of the former corresponded to the lower part of the latter. And the cause of this shortness was the greater incurvation of the former than of the latter; which was extremely manifest.

Nor were other appearances of disease wanting, in that bone, besides these; as, for instance, the diminish'd breadth of the head at the lower part, no sinking-in of the bone, betwixt the great trochanter and the cervix; and both these parts were thicker than they naturally are: so that if the woman was ever thin, this thickness might have deceiv'd any surgeon, who examin'd the bone, under the appearance of a luxation.

That os femoris was, in like manner, thicker than it naturally is, from the cervix to at least the middle of its length; and had the convex part of the curvature turn'd towards the external side: and consequently the posterior surface of its condyles look'd towards the left femur; so that the leg also, and the foot, could not be in their proper situation.

In attending to all which circumstances; you will readily perceive, that these disorders, of the lower limb, had existed from the original formation; or at least from the time of infancy: and therefore, that it was not surprizing the woman had always been lame.

At length the head (on the account of which chiefly, I describ'd this dissection to you) was open'd: and the dura mater being remov'd, we saw the vessels that pass through the pia mater indeed to be distended with blood; but no blood, nor serum, was found to be effus'd any where, till we came to the left ventricle, by cutting into the left hemisphere of the cerebrum, the substance of which was firm.

For then a bloody serum began to be discharg'd, and not in a small quantity; that is to say, it came from a large quantity of blood, which had coagulated in that ventricle. The same kind of serum was also found in the
right

right ventricle, and in the *iter ad quartum ventriculum*, as it is call'd; but we did not find any injury from whence we could, for a certainty, say, that the blood seem'd to have been discharg'd: although I suppose it to have lain hid in the left ventricle.

Then transferring the knife, from thence, to the cerebellum; which appear'd to be every where found on its external surface; behold, within its right lobe, we found a cavity, and not a small one, which was very full of blood form'd into coagula.

7. Enough was said just now of the causes of the lameness I have spoken of. In regard to other things I have already treated of them (*f*), and shall treat hereafter (*g*). But in regard to the two apoplexies which had preceded this last, it is to be suppos'd, that both of them had left such dispositions in the cerebrum and cerebellum, as prepar'd a more easy access for the third; so that, by rupturing the internal vessels, it carried off the woman: and this the more easily, as no remedies had been made use of.

And since vessels were ruptur'd not only within the cerebellum, but within the cerebrum also; as the blood extravasated in both seems to show; they have therefore render'd two things, which might have been deduc'd from this dissection, in relation to the cerebellum, uncertain and doubtful; I mean, whether an injury of one of its lobes is follow'd by a paralysis in the opposite side of the body; and in like manner, whether the pulse and respiration depend upon the cerebellum.

For, what if that cavity in the cerebellum were only produc'd by the force of the blood, when death was coming on? Or what if the resolution which was on both sides, were to be accounted for, from the blood extravasated into both the lateral ventricles of the cerebrum?

However, an observation of mine, which I shall write to you (*b*) at another time, will afford me an occasion of treating upon both these questions more clearly.

But now lest you should imagine, that the sanguineous apoplexy, which kills very speedily, cannot exist without a rupture of the vessels; we will immediately subjoin to the three which are propos'd with this rupture, as many which have been fatal very soon; or at least in not a very long time; without this effect.

8. A man, to appearance of forty years of age, having come from Milan to Padua on foot, before the end of January of the year 1756, was so wearied with his journey, that he went immediately to the hospital; into which he was receiv'd, merely on account of his weariness, and not for any fever: and while he was sitting there still out of bed, and taking food, he was suddenly struck with a violent apoplexy, without any mark of external sense or motion; and though blood-lettings were made use of, yet they seem'd to be injurious rather than useful; and he died within two days.

The body was given us, in order to pursue the public demonstrations of

(*f*) Epist. 56. passim.

(*g*) Epist. 69. n. 2. 10. & seqq.

(*b*) Epist. 62. n. 15.

anatomy. And while we were doing this, before the time of opening the skull came on, I observ'd these few things.

In the belly, the gall-bladder was turgid with bile.

In the thorax, the figure of the heart was such as I do not remember ever to have seen in a human body at any other time; and resembled that which we see form'd by the most unskilful painters; as if the right side of the heart were finish'd by a curv'd line: that is to say, the upper part of the basis and the lower part of the apex were prominent towards the right side. And indeed the septum of the heart itself follow'd the same unusual curvature.

The heart was rather small than large; but had its valves, and other parts of that kind, small, even below this proportion. The great artery, after having sent out the left subclavian, was rough to some extent internally, by reason of prominent fibres; as if the internal coat were wanting.

At length having remov'd the upper part of the cranium and dura mater, we saw the vessels of the pia mater, indeed, to be very much distended with blood; as we also did those very small vessels, that pass so plentifully thro' the medullary substance of the brain; but we could no-where find any extravasated blood; notwithstanding what serum was contain'd in the lateral ventricles, the quantity whereof was not small, we saw to be bloody: and notwithstanding in the plexus choroides, where they are inflected in the termination of their ascent, small hydatids were seen; but particularly in one of these plexusses.

9. These hydatids we have been wont to see there frequently, and equally, in others who have not been carried off by an apoplexy: and as to the serum, it can scarcely happen, but that, while we cut into the brain; whose crowded vessels are distended with blood; it must appear bloody, even from a very few drops of blood being mix'd therewith.

And if you should choose to suppose, that this apoplexy was in part owing either to the acrimonious and irritating property of the serum, or to the quantity of it, though not large, encreasing the compressions of the brain; according to what I have formerly written to you (*i*) in treating of serous apoplexies; I shall not contest your opinion: for it is sometimes difficult to separate the sanguineous apoplexies from the serous; and to determine, in regard to some particular histories, to which species they certainly belong.

Yet I would have you previously well consider the conjectures which may be advanc'd on both sides; and where the external and internal vessels of the cerebrum are both very greatly distended with blood, at the same time; as in the man in question; take care how you too easily deny, that the cause is, in chief part, to be deduc'd from the blood.

But whether to that great lassitude, following the fatigue of a long journey perform'd at such a time of year, any thing might be contributed by the constitution of the man; which that unusual figure of the heart, and that internal injury of the aorta, probably show not to have been the most robust; I leave quite undetermin'd: yet that lassitude diminishes the strength of the whole body, and of the brain also, and its vessels; and therefore makes the brain more liable to compressions, and the vessels to distensions; I have not the least occasion to doubt.

10. A woman, nearly of the same age as that man, being receiv'd into the hospital not many days after him, was brought from thence, (where she died) within two days, into the anatomical theatre.

The cause of her death had been an apoplexy of such a kind, that, on the fourth day from the beginning thereof, when she was brought into the hospital, she then, at least, retain'd no sign of any remaining power of feeling or motion; and scarcely open'd her eyes, while red-hot plates of iron were applied to the soles of her feet, in order to excite her; but in vain; for she soon after shut them again.

The carcase, if you excepted one leg that was disfigur'd with an ulcer, had no appearance externally, that made it unfit for the use of teaching: and even internally, in those parts that I examin'd, I found very few things differing from the usual and regular appearance of nature.

For in the trunk of the aorta, where it goes down through the belly, were slight internal whitenesses in some places; which were the beginnings of future bony scales: one of which, though small, was already form'd.

The left Falloppian tube adher'd to the testis in the middle of its course: this testis was but small, if compar'd with the right, and had a few white globules within; in dissecting one of which I saw it to be made up of a compact substance, hollow in the center.

But the right testis, which, in magnitude, would have been suitable even to a younger subject, contain'd no globules, and no vesicles; yet was of a tuberos surface; and if you fix'd your eyes attentively down, was not without marks of small cicatrices.

It was also observ'd, in the dissection of this carcase, that the membranes gave more resistance to the scalpel, than they naturally do; although fat was not wanting.

Finally, upon opening the cranium, all the vessels within this cavity, not excepting even the *plexus choroides*, were found to be turgid with blood. But setting aside a little quantity of water in the lateral ventricles, I could not find any diseas'd appearance in the cerebrum, cerebellum, or medulla oblongata, wheresoever I cut into their substances.

11. If you should chuse to compare together all the appearances that had been seen in the living bodies, or in the bodies after death; I imagine you will not very greatly be surpriz'd, that this woman died later than the man of whom we spoke before; and still much later both of them than another man of whom I shall speak immediately.

12. A barber of five-and-fifty years of age, whose head was in great measure bald; and who drank to so great a degree, as to be brought home drunk, on the eve of the 16th of January, in the year 1757, was found dead the next day in the morning, lying on the ground betwixt the bed and the wall, near to a broken chamber-pot; but without any injury being done to any part of his body.

As I made use of this body to begin the public demonstrations in anatomy that year, I observ'd these things that were preternatural.

The belly being open'd, a large stomach came into sight; the internal surface of which was ting'd with the colour of wine. The omentum was fill'd with a great quantity of fat, as the external coat of most of the intestines

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was, and the mesentery also; in which some glands were of a larger size than that age generally exhibits.

The bile, which was of a yellow colour degenerating into brown, had left, on the internal surface of the cyst, many white granules of sand, as it were; but such as, when rubb'd betwixt the fingers, were not at all hard.

The surface of the kidneys, one of which was longer than the other, was not without some traces of disorder; among which was a small cavity under the coat, that was full of moisture.

The bladder was so distended with urine, that the upper part of it was higher than the bones of the pubes; and that considerably too. And as it is to be suppos'd, that it had also been often immoderately expanded in the living body, so it was not surprizing that the form of it was uncommon: for, although, at the lower part, it was somewhat broader than at the upper; yet at first sight it resembled a cylinder, or a prism, rather than any other figure.

The urethra was every-where white internally; and not only furnish'd with fewer and smaller orifices of our canaliculi, but moreover had the seminal caruncle almost obliterated, as it were; so that in this urethra nothing could be clearly demonstrated: and as the rostrum of the caput galinaginis was quite wanting besides, it was natural to suppose, that neither the caruncle, nor the other part of the urethra, had been formerly free from a greater disorder.

The internal surface of the great artery, where it runs down upon the vertebræ of the loins, shew'd the beginnings of ossification: and the iliacs had bony lamellæ perfectly form'd; which were so much the harder, the more they approach'd to the lower parts, after being divided into the external and internal vessels; so that the crural arteries, in several places, and even when receiv'd betwixt the condyles of the femur in the ham, were hard, and rigid: and the arteries seem'd to be the more subject to this disorder, the farther they became remov'd from the heart.

And above the belly, at least, where the aorta sent forth the inferior intercostals, appear'd the beginnings of ossifications; but these were quite slight. Besides which I observ'd no other disorders in the thorax, nor in the rest of the body; if you except what I am about to mention.

For the upper part of the cranium, and the external of the meninges, being taken away; both of which parts were pretty thick, so that the latter, where it is interpos'd betwixt the cerebellum and the cerebrum, resisted the scalpel more than it generally does; though I examin'd all the appearances, and pass'd over none of those parts that are within the skull without dissection; I not only did not find any extravasation of blood, or serum, but not the least disorder, besides that which I shall mention.

That is to say, the vessels which pass through the pia mater were so fill'd with blood, and so dilated thereby, that I never remember to have seen them more so. Those also which make up the plexus choroides, and which are carried through the parietes of the lateral ventricles, (where there was a little water) were distended: and on the left side particularly.

13. I would have you compare this observation with that which I made upon

upon Peter Fasolati (*k*). You will find many circumstances in both of them, which agree with one another; and many, likewise, in the remarks I made thereon, in order to explain it; which, therefore, I need not repeat here. Yet we may add some things which are peculiar to this man.

This man had been a drinker, and of course frequently intoxicated: and how much drunkenness tends to increase the quantity of the blood, and to weaken the vessels which are within the cranium, you easily conceive.

Add to this those ossifications in the inferior arteries; which, as they prevented the motion of the blood downwards, forc'd it, in like manner, to be carried upwards in a greater quantity.

But this also must in particular be added, that when the man lay under the effects of that last very great drunkenness, and slept, a great quantity of what he had taken in began to be added to his former quantity of blood; particularly the wine; and when the bladder had receiv'd so much of it, as not to be able to admit any more, and yet the man; in consequence of being oppress'd by his drunkenness and sleep; did not perceive the necessity of unloading his bladder, by which means he would have prepar'd a fresh receptacle therein for the remaining matter of urine; which was in the mean while carried into the general channel of the circulation; when this, I say, was the state of the case, it must have happen'd, that the vessels were more and more distended, from this retain'd matter, and those in particular that are within the skull, (as they had already, for a long time, been weaken'd) and particularly in the posture of lying down; wherein they were more subject to repletion.

See how Lower (*l*) explains, almost in the same manner, violent disorders of the brain, which had occur'd to him, (and among these, in particular, the apoplexy) that have arisen from lying down, and sleeping, immediately after drinking largely; and before the greatest quantity of the liquor, that has been drunk, has been discharg'd by the bladder.

14. I suppose therefore, that the man of whom I have given the history, having perceiv'd the fullness of his bladder when it was too late; and having attempted to take hold of, or rather having actually laid hold of, the chamber-pot, and endeavour'd to discharge the urine from his over-distended bladder, which is not a very easy task; had fallen down in a very violently apoplexy, in that very nifus, which retains a greater quantity of blood in the vessels of the brain.

For the external and internal vessels, that are within the skull, might, at length, have come to such a degree of distention, as vehemently to compress whatever is contain'd in the cranium.

But because both in these and other letters, the cause of the apoplexy has often been deduc'd from compressions of this kind; be cautious how you suspect that the experiments of the celebrated Laghius (*m*) are contrary to this explication; in which experiments, by means of that truly elegant instrument, invented by the very noble, and, at the same time, very ingenious count Gregory Casali, he shews that, in dogs, the brain may be compress'd

(*k*) Epist. 3. n. 26.

(*l*) Traët. de Corde, p. 2.

(*m*) De Sensibilit. &c. Serm. 2.

to at least six lines of London, without any sign of uneasiness in them: and indeed, that when they do begin to complain, they soon after grow quiet, unless the compression be increas'd: and that they do not fall down as seiz'd with an apoplexy, before the degree of compression amounts to about an inch.

For this compression is a very different thing from what we are now speaking of; since the former is applied only to a part of the brain, and that a very small part; but ours, of which the question is in this man, is applied all round about; and even internally in every part; to the cerebrum, the cerebellum, and the medulla oblongata, at the same time.

But if it was not of that kind in others at any time; yet we have still added other circumstances, and have suppos'd it to take place in a cranium every-where shut up, at least, and resisting; and not open in any part: although that woman, of whom Poupert presented a memoir to the Royal Academy of Sciences at Paris (*n*), had half the skull deficient; and yet when any-one touch'd the dura mater slightly with the point of his finger, such an uneasiness was brought on, that a thousand little torches seem'd to be flying about before her eyes, and she was oblig'd to cry out exceedingly.

But I would have you consider those experiments, as far as the matter concerns me; and make use of them, in order to allow, without any surprize or admiration, not only other things, but in particular this; that the brain may be capable of enduring a certain degree of compression, without any uneasiness: and that it can accustom itself thereto, when increas'd gradually so as to be troublesome; provided it does not increase beyond that point; till at length such a degree of pressure be finally added, as must necessarily overcome and destroy the animal.

15. Thus far (for other observations, relative to this disease, it will be better to delay the description of, till we come upon the subject of the hemiplexia (*o*), and the aphonia (*p*); thus far, I say, of the apoplexy. From which we shall go on, presently, to other disorders of the brain. Farewèl.

LETTER the SIXTY-FIRST

Relates to those Deliria which happen without any
Fever.

1. **T**HAT disorder of the brain, whereof I wrote to you lately, is certainly a violent one; I mean the apoplexy. But violent also, and indeed still more pitiable, is that of which we are now about to speak; I

(*n*) Hist. A. 1700. Obs. Anat. 20.

(*o*) Epist. 62. n. 7. 9. 11.

(*p*) Epist. 63. n. 13.

mean

mean madness, or delirium without a fever. I have as yet three dissections relative thereto.

2. A woman affected in her senses, to all appearance of a middle age, after various misfortunes, died in this hospital; and in the beginning of the year 1746.

Left I should be in great streights to get bodies, in order to finish the anatomical demonstrations to the pupils there; I enquir'd whether this body would be proper for that purpose.

Having heard that, by reason of its being greatly emaciated, and, in like manner, by reason of a very large and foetid gangrene on the os sacrum, the thorax and the head were the only parts proper for my intentions; I order'd all the others to be buried, and only the head, together with the thorax, if this were without any purulency, which the extremely emaciated state made me suspect the existence of, to be preserv'd.

The thorax therefore being open'd, and my suspicion appearing not to be a vain one; since one lobe of the lungs was, in great measure, full of pus; I order'd these viscera likewise to be buried: and began the dissection of the head.

The cranium being open'd, this one thing was observ'd in the meninges; that the pia mater, though but slightly laid hold of, and drawn, very easily follow'd, and came out from the convolutions of the brain.

There was no doubt, then, but water was beneath; a quantity of which was found even in the ventricles: but a larger quantity had flow'd out from the tube of the vertebræ. And yet the substances both of the cerebrum and cerebellum were, beyond the least dispute, more hard than they usually are.

The plexus choroides I indeed saw to be discolour'd; but where they lie upon the chink, or fissure, of the third ventricle, they were so firmly conjoin'd, by their small vessels, with its edges, that the fissure did not open at all, till after those vessels were accurately disunited.

Besides these things, nothing worthy of remark occur'd, except the pineal gland; which seem'd to be larger than usual, and annex'd to its seat by longer medullary radicles: and at the same time was more of a mucous nature than usual.

3. As I have treated of persons affected in their senses heretofore, you may remember what diseases I took notice of (a) in them, as observ'd by others, and particularly by me, in relation to the pineal gland: and these I have not been silent upon even in another letter (b).

Since that time has come out the *Prolusio* (c) of Justus Godofredus Gunzius, which I could wish had been then publish'd.

For as he was a man of great erudition, he has quoted most of those authors who have made mention of the disorders of this gland; and by that means would have lessen'd my labour, such as it was, in producing these authors: and that either as to what relates to persons that are insane, or as

(a) Epist. 8. n. 14. & 16.
(b) Ut 59. n. 15.

(c) De Lapillis Gland. Pineal. in quinque mente alienat. invent.

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to what, in general, relates to those who have had little stones, or particles of sand, in this gland (*d*).

Nevertheless that has happen'd, which is very easy in affairs of this kind; I mean, that one of those who are mention'd by me, has escap'd him; and, on the other hand, that some of those quoted by him, have escap'd me; as in general I am not wont to mention any others, but those that occur to me while I am writing.

And to this I may add another reason, why I am not very sorry for having undertaken that labour; because from thence, join'd with my observations, which I have given at the same time, or separately, it is easy to perceive, not only that it has not happen'd to others, as it has happen'd to a celebrated anatomist at present living, "That in all the carcases of adult men, who died of any disease whatever," they found the pineal gland "fill'd with a great number of sandy particles;" but this also, that there is no longer any room to hope, that, from the soundness of this gland in those who were not unsound in their minds, or from the diseases of it in those who were, the opinion of Des Cartes, in regard to the seat of the soul, should be confirm'd.

At least, I have describ'd to you disorders seen in that gland, or about that gland, thirteen times. And you will see, that in nine of these instances (*e*), it was without madness; or any alienation of the mind. On the contrary, you will see that there was an affection of this kind in others (*f*), in whom this gland had no disorder; as you will gather from my silence on that head.

For almost always, when I dissect a brain; and not only in the bodies of insane persons; I make a practice of inspecting the pineal gland attentively, both within and without: and if there be any-thing in it worthy of remark, to transfer it into my common-place-book; and from thence into my descriptions.

4. And this my almost universal custom sufficiently shews, that the laudable exhortations of Gunzius were not waited for by me; but that long before, I had not neglected to remark, in my observations, not only what was natural in this gland, but what was preternatural therein; and, at the same time, as you very well know, to mark down the appearances in the other parts of the brain, and in the remaining parts of the body: and not these alone, but what had preceded in the living bodies, as far as I could see, or be inform'd; although, when I happen'd to have occasion to mention this gland, I have not been willing to touch upon any other things, than those which were sufficient for our purpose: nor do I as yet repent, that for those reasons; which whether he has invalidated altogether, is not the place to determine here; I have spoken of the nature of this gland in such a manner, as to seem doubtful, whether it was not, in some respects, different from the other part of the substance of the brain.

(*d*) Epist. 5. n. 12.

(*e*) Epist. I. n. 14. III. n. 14. V. n. 11.

VI. n. 12. VII. n. 15. X. n. 17. XI. n. 11.

XIV. n. 35. XXI. n. 24.

(*f*) Epist. 8. n. 4. 8. 11.

There is, certainly, no other part in this whole substance, which is so frequently, as that gland, subject to particular disorders; and especially, that contains sandy particles and stony concretions so often.

And although you have heard above, that this disorder has been found with madness, and without it also; yet I would not have you forget, that there is not any one disorder, wherewith it is so frequently found to be join'd, as with madness.

And if the observations, which I have given heretofore, and pointed out (*g*), should happen not to be sufficient to demonstrate this circumstance; yet there are still others in Gunzius, which you may add.

I do not speak of those wherein he conjectures, that there was an alienation of mind, in such a manner, as to leave you at liberty to deny it, if you think proper.

But I speak of others, in which there was an evident and real madness; and these either taken from authors that he has quoted, or made by himself: and I speak of the latter in particular, since they are taken with such accuracy, as to make them worthy, if any others are, of being added to the Sepulchretum.

And if you read these observations over, I would have you, among other things, observe that the stony concretions, which he found in the pineal gland, were either yellow, or approaching to yellow: and then observe what other disorders, which I am presently to take notice of also, were seen by the same author; not only in that gland, but in the brain of insane persons in general; as you have seen of what nature these were in the woman in question, and will see below (*h*) in another.

5. A man, about forty years of age, from the time of being a rower in the galleys, became at first hypochondriac, and after that mad: but his madness was of a joyful kind: in this state he continu'd ten years; when, at length, being somewhat swell'd in his whole body from a cachexy, and having a difficult respiration, he died in the hospital about the first days of January, in the year 1750. In his body were the following things worthy of remark.

The thorax contain'd a great quantity of water: and some part of the lungs was indurated.

When the head was cut off, a very small quantity of water flow'd out of the cranium: and this they observ'd when they cut into it, and, in like manner, when they took out the brain. Which I, for certain reasons, had not in my power to dissect, till the third or fourth day after it had been taken out, as I likewise could not at all examine the parts contain'd in the belly.

In examining the brain, therefore, with accuracy; if I omit the smallness of the pineal gland, which is a doubtful circumstance; I found no other things that relate hereto, except that the medullary substance of both hemispheres was somewhat harder than usual; and that the tract, which is somewhat prominent through the middle and upper surfaces of the corpus

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callosum longitudinally, was not single only, from the beginning quite to the end, but in one place double.

6. In regard to the hardness, we will consider that afterwards. Now let us consider what relates to the corpus callosum.

As that celebrated man Joannes Fantonus; to whom Lancisi wrote his dissertation upon the seat of the *anima cogitans*, or soul, in the corpus callosum; had seen in a certain man (*i*), who was not disorder'd in his senses, the pineal gland "three times as thick as usual;" so he also saw another man (*k*); in whose corpus callosum he found a hard tumour bigger than a walnut; troubled with an obstinate cephalœa in the crown of the head, and with epileptic attacks: but did not observe him to utter any absurd things till the last months of his life, and even then not always, but only frequently; and that merely when the pain in his head was very violent.

And I have observ'd many appearances of less consequence in that same corpus callosum. For instead of that tract whereof I spoke last, which is in some single and simple, and in others double; so that Lancisi call'd the double appearance *nervuli longitudinales*, as I have taken notice of heretofore (*l*); I have met with two sulci, and those of a considerable depth, in the body of an insane person (*m*).

And you will see that Gunzius (*n*) had observ'd, not only the *nervuli* of Lancisi in another person, but a sulcus, or furrow also, "proceeding on in "a winding course, and seeming to be defective, as it were, in some "places."

And Lancisi himself had observ'd those *nervuli*, in an idiot, not to have been "parallel to one another, in the manner they generally are."

Shall we then allow the cause of insanity of mind to consist in things of this kind?

I have not now that reason for doubting, which I had, from a frequent suspicion that these tracts, and sulci, in those parts, are not form'd by nature for the sake of any utility or advantage; but either from the compressions of both hemispheres of the cerebrum; where the right and the left, coming near to each other, terminate in the lower border, and change the cortical substance into that medullary part which lies like a vaulted roof; as I shall shew very clearly in another place; upon the right and left side of the corpus callosum; or, as I see it has lately come into the mind of a very ingenious man, that they are owing to the pulsations of the arteries, which lie longitudinally, in like manner, upon the middle of the same corpus callosum.

For both these suspicions seem to be invalidated, by those lower and more slender parallel tracts, which pass on one side, and on the other, to the middle of the same surface; the conformation of which tracts cannot be accounted for from the causes I suspected.

And indeed, although both the suspicions, and particularly the second, should stand good; and any person should suppose himself at liberty to con-

(*i*) De Obs. Med. & Anat. Epist. 8. n. 3.

(*k*) Epist. 5.

(*l*) Epist. 8. n. 6.

(*m*) Ibid.

(*n*) Prolus. supra ad n. 3. cit.

jecture a different and noxious internal constitution of the corpus callosum, from a different course of the arteries; yet how could he, by these means, explain madness, which is not innate, nor congenial, but adventitious?

My reason for doubting, therefore, is taken from other considerations; that is to say, from observing, not only that those irregular conformations of the surface of the corpus callosum are very seldom found in the bodies of insane persons, but also that they have been seen by me in many bodies, in which, when living, there had been a perfect sanity of mind.

As, therefore, I judge that these things deserve farther consideration, I will pass on to that appearance which always, or at least almost always, has occur'd to me in the brain of insane persons; and which was remark'd even in the two observations in question.

7. A woman, of more than thirty years of age, who, from her very birth, had been insane; at last taking a resolution not to eat, nor to drink, had died in the hospital, at that time in which it was my custom to pursue, in that place, the anatomical exertions that had been a little while intermitted; that is, about the beginning of January in the year 1757.

In examining the parts of the belly; for those which belong to the thorax I had previously demonstrated from another body; nothing seem'd more surprizing, than that a woman, who was yet in the prime of her life, and an idiot, should have, to all appearance, preserv'd her virginity.

For at the orifice of the vagina, which was narrow as in a virgin, the ring of the hymen was not wanting: nor had it any rupture; although it had a broad foramen, as it generally has in those of a more mature age. But I was the more doubtful upon this subject, when I saw the vagina to be extremely smooth in its whole surface, excepting a very few rugæ at the lower part.

The orifice of the uterus and the uterus itself were found; and in the state that was to be expected in a virgin. Neither of the tubes gave passage to a slender probe introduc'd by the larger orifice: or, at least, not farther than to one half their length. Both the testes were pretty hard, white, and of an unequal surface; having no vesicle within.

But when I cut into, and examin'd with attention, all the parts comprehended in the cranium, I found them all in a natural state. And if you ask particularly in regard to the corpus callosum, and the pineal gland; in the former was one simple tract; the latter was somewhat large indeed, and from a brown colour almost yellow as it were.

One thing only, therefore, was worthy of particular observation: I mean, that wherever I cut into the substance of the cerebrum, and cerebellum, I found it to be evidently harder than usual.

8. For this was the very circumstance which I said was in the two observations in question; and even in almost all the others that I have made, relative to the dissection of persons affected in their senses.

Turn back to my eighth letter (c), you will see that in all the bodies of insane persons, which I had dissected to that time, the appearance was al-

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ways the same. And in what bodies this circumstance occur'd to others, you will find in the same place (*p*).

And you may now add Gunzius (*q*), who saw the brain “ dry and compact ” in two bodies, and of such “ a firmness,” that he could not consider it as very sound.

Yet it certainly did not happen to him, nor yet to those others, as far as I know, as it had happen'd to me ; I mean, that in dissecting the bodies of many maniacs, they found the brain very hard in them all.

But it has, at length, happen'd to me ; as you will read in the fifty-ninth letter (*r*) ; that in the body of a man, who had labour'd under a kind of melancholic delirium, I found the brain very lax : perhaps because the delirium had been very slight ; or because it was now cur'd : although it is of very little consequence to me, from which of these causes it was, or whether from any other ; as I did not scruple to declare (*s*) who had seen the brain lax in maniacs, and did not attempt to conceal (*t*) that it may be hard without madness, in the place where I expressly added this remark, that the very frequent observation of a hardness in the brain, in this kind of disease, is not to be neglected indeed ; but yet, what I now confirm, that it did not seem as if this were to be principally regarded.

And it will be thought, that this is to be so much the less regarded, if any persons ; following the opinion of a learned man, who chooses to deduce the cause of madness from the blood being become very thick and viscid, and circulating very slowly, for that reason, through the small internal arteries of the brain, distending them, and by the distension thereof, compressing the contiguous medullary substance, and by that means rendering it less fit to perform its usual offices ; if any persons, I say, following this opinion, shall add that the substance of the brain, when press'd by the distension of the small arteries, is, by these means, compacted together and constipated, and consequently becomes harden'd ; but that the cause of madness is to be deduc'd from the internal disposition of that substance being chang'd, in some way or other ; and not from the hardness which accidentally accompanies this change.

However, if you should wish to judge, from my observations, whether, in the brain of insane persons, the vessels are so frequently found to be immoderately distended with blood, as that hardness is found ; read the observations once more : and since other learned men are not wanting, who think, that madness may be owing to polypi form'd within the sinusses of the brain, and produce, with that view, two or three dissections of the brain and viscera of maniacal persons ; I would have you consider these dissections, as such whereby you may encrease the number of observations relative to this subject : but in regard to polypi, I would not so much as wish you to enquire, whether I have ever met with them in the sinusses of maniacal persons, as to call to mind those things that you have already receiv'd from me (*u*), in re-

(*p*) n. 17.

(*q*) Proluf. *supra* cit.

(*r*) n. 15.

(*s*) Epist. 8. n. 18.

(*t*) Ibid.

(*u*) Epist. 24.

spect to polypi not being to be allow'd of, except in a dying or a dead body.

But now let us go on to other things.

9. Though all hydrophobic persons are not delirious, as has been shown in the eighth letter (x); yet, in that letter, lest I should recede from the order of the Sepulchretum, I have spoken of hydrophobic patients after maniacs.

We will do the same thing in this letter. And as, in this interval of time, it has not happen'd that I had any opportunity of dissecting the bodies of patients of this kind; I will make mention of those observations, of other authors, on these bodies, which were not then extant.

And I could wish they had given them in full: for though the intention of some was so to do, yet different causes interven'd to different persons.

And indeed that illustrious man Senac (y) was prevented, by the very intention of his writing, from saying more than this; that he had seen the pericardium so constricted, and annex'd, to the surface of the heart; in a man who died of dog-madness; that it could not be separated therefrom.

And Alexander Bruce, in a dissertation publish'd at Edinburgh (z), in the year 1755, relating an observation of the celebrated Rutherford, made upon a hydrophobic patient, whilst living and after death; which patient had been in the hospital there; after having mention'd other appearances; and among these the great distention of the large intestines with air, a slight inflammation of the ileum, with lividness here and there, as also a disease of a portion of the liver, and the circumstance of this viscus being forc'd out of its seat, together with the rest of the viscera, but nothing unusual in the thorax; when you expect to hear what was the state of the brain, the larynx, and the pharynx, says nothing more than this: that the inspection of these parts was prevented by the relations.

And for the same reason, probably, I should suppose it to have happen'd, that Morando Morandi (a), a man whose untimely death I cannot but lament, wrote nothing upon these three parts, when he publish'd, in that very year, some of his dissections of persons who died of the same disease.

For in one of them I see nothing taken notice of, but that some of the external and internal muscles of the thorax were inflam'd; and even very near to a gangrene, and to a putrefaction as it were.

Yet in two he has given no hint upon the subject of these muscles: but has said that the stomach and intestines were affected with a gangrene, and daub'd over with a black and foetid bile; that the bladder, and the corpora cavernosa penis, were seiz'd with an inflammation; that of the membranes many were dry and tense; and many others closely coher'd with the viscera, as in a peripneumony; being all nearly depriv'd of their fat, and the omentum almost dried up; finally, that the veins were quite full of the most fluid blood: but that the arteries were empty, contrary to what others; which is a circumstance he was by no means ignorant of; though not all, had seen in hydrophobic patients.

(x) n. 19. & 22.

(y) *Traité du Cœur*. l. 2. ch. 1. n. 1;

(z) *De Hydrophobia*.

(a) *Della Cura preservat. della Rabbia Canina*.

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10. And these observations, if you consider what is deficient in each of them, will immediately show, that hereby is not encreas'd the number of those which I complain'd, in the eighth letter (*b*), were as yet too few.

But if you consider what each of them proposes, as being found even in some parts of the body only; and compare it with the observations of every kind; the united sum of which I have referr'd to distinctly, and in order, in that very same letter (*c*); you will at least see, that they will be useful to confirm the great variety, which I there shew'd to exist, among hydrophobic patients; nor is it to be wonder'd at, since even these few which I have at present added, are so different from each other, that what circumstances some have, others have not; or at least not entirely.

And the more I see those varieties confirm'd by new observations, the more clearly I perceive, that no equally probable conjecture, upon the cause of the hydrophobia, can be taken from any other source, but that from whence I took it, in conjunction with the most eminent men (*d*).

For how, by way of example, can I account for the difficulty of swallowing water, which is common to all, from the disorder of the blood; which I know has been seen to be different in different persons? And indeed the blood of that hydrophobic patient, which the Edinburgh dissertation (*e*) mentions, when taken from the veins, "was good through the whole course of the disease."

But if I suspect some peculiar change to be brought on by this poison, in the brain and the nerves; from whence they may be easily constrain'd to excite external or internal convulsions; scarcely any thing will prevent me from explaining therefrom, that difficulty of swallowing which is common to all; and that great number of varieties in the living and dead bodies, according to the various disposition of various persons: but if you think that even then I have not done enough, you may read the dissertation I have commended, which not only follows the same conjecture, but thereby explains every appearance in the living and dead body; particularly in the living body; sufficiently and at large.

11. You see how far I suspect the brain to be affected, and that by the force of this poison too; lest you should suppose me to be of the opinion of those persons, who have attributed all this disease to the force of the imagination merely.

I confess however, that I do not take upon me to deny, but it may be encreas'd by fear, and a conception of danger. Yet I do not think that fear alone is sufficient to produce it.

For how could it be brought on by fear, in many persons (whose cases I shall take notice of a little below (*f*)), who being ignorant that the animal, whereby they had been bitten, was mad, thought of every thing but this; and yet shew'd that they were already affected with a disease of which they had not the least suspicion: and that by very manifest, and soon after fatal, symptoms.

The poison, therefore, which is admitted; in whatsoever manner it may

(*b*) n. 32 in. fin.

(*c*) n. 30. 31. (*d*) n. 32.

(*e*) supra ad n. 9. cit.

(*f*) n. 15.

be suppos'd to act; must be acknowledg'd to be the cause of the disease. And indeed the more latently and insiduously this poison preserves its force, and at length brings it into action, the more cautious ought we to be in preventing its admission; and if it has been accidentally admitted into the body, the more diligent ought we to be in counteracting its efficacy; before it can exert its pernicious qualities.

If, therefore, it should at any time be a question, whether the flesh of an animal affected with canine madness, can affect therewith the persons who eat it; I should be less influenc'd by the example of Scaramucci (*g*); wherein the flesh of a sow, which had been bitten by a mad dog, was eaten without occasioning any injury, although it were certain that this madness was already manifest in that sow; I should be less influenc'd, I say, by these examples, than by those of a contrary nature; and particularly that of Bauhin (*h*); to which may, moreover, be added, the observation of Lemmery (*i*), of a dog becoming mad, by eating blood which had been drawn from a patient affected with the hydrophobia: nor does it make the matter very different, that the blood was not boil'd, as flesh generally is; since a very different, and even extreme, force of fire is requir'd, in order to make us suppose, that a virus, which adheres very closely and obstinately, can be entirely driven away.

And although the observations which are produc'd from Zacutus (*k*), of the blood of mad dogs adhering in such a manner to a sword wherewith they had been stabb'd, and preserving its poison to such a degree, that, being introduc'd from thence into wounds, even many years after, it brought on canine madness; although, I say, these observations are too much of the marvellous kind to be readily believ'd by every one; yet I think, if I am not mistaken, I have read a more credible one in the work of the celebrated Brogiansus (*l*); and would not deny but it is necessary for those who dissect dead bodies, to be frequently admonish'd, that they be very attentively cautious in the examination of hydrophobic bodies; and that they do not accidentally prick, or cut, their fingers; nor rashly presume to daub over their hands, if they happen to be affected with little ulcers, with the blood, or any other juice, of these bodies.

12. But in regard to these, and other cautions against admitting so dreadful a poison; if we are to be faulty on one side, none will deny that it is better to be over-cautious, than but little so; and especially one who considers how difficult an undertaking it is, and how uncertain in its event, to overcome this poison, after it has been admitted, before it betray itself by the dread of water, and the difficulty of drinking thereof.

For when the matter is so far advanc'd, so rare are the successful, stable, perfect, and certain cures, that to those who consider what generally hap-

(*g*) Eph. N. C. Dec. 3. A. 9. & 10. in Append. sub n. VI.

(*h*) apud Stalpart. Cent. 1. Obs. 100. in Schol. haud procul a fine.

(*i*) Hist. de l'Acad. R. des Sc. A. 1707. Obs. Anat. 1.

(*k*) apud Stalpart. Schol. cit.

(*l*) De Veneno Animant. P. 2.

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pens, that which Ovid (*m*) said of medicine in his time may still seem true.

Nec formidatis auxiliatur aquis.

“ Nor do the dreaded waters give relief.”

For which reason it is the more to be wish'd, that the disease may not come to this stage.

And as to the bath, which has been so much recommended in other places, we find there are many in those very places; as we have formerly seen (*n*); and even among our own countrymen, who do not put any confidence therein.

Wherefore some did not fail to have recourse to mercury; and to the remedies prepar'd therefrom. In pursuance of which method, others; particularly in this age, and even among the Italians; began to make use of the same preservative method.

Thus Morand (*o*) has produc'd many observations of his own to this effect. Yet he has join'd a mercurial remedy with others that are alexipharmac; and indeed has since added musk, in imitation of the Chinese: and this that the preservative cure, as he himself says, may be the “ more safe.”

This great number of remedies, and cupping-glasses, which are applied to the wound, in the beginning, by some persons, and even the red-hot iron deeply impress'd upon almost all wounds of this kind, not only leave it uncertain, among physicians, to what remedy chiefly the safety of patients is to be ascrib'd; but also make the mind of a man; who has been bitten, and is about to make use of them; fearful and uncertain, whether, even by these means, he shall be safe for the future: and especially a man who is in doubt, whether those who are said to have been sav'd, had really contracted the poison; and would certainly have fallen into an hydrophobia, without the use of these remedies.

And although this doubt may not be just of all persons; yet the very suspense of mind must, of course, bring on so much uneasiness; in an affair of the utmost importance; that even for the sake of avoiding this very anxiety alone, no caution, in avoiding the poison of a mad dog, can seem too great to any person.

13. Nor ought we to ascribe so much to the remedy, which was communicated to the Royal Academy of Sciences (*p*); notwithstanding it has been surprizingly useful, not only by way of preservation, but by way of cure; as to acquiesce therein, before it be certain, that it had produc'd the same effect in all persons: and that for a long course of time in succession.

For by continu'd experiment it has been found, that many remedies which had been formerly in great esteem; as preservatives, or curatives, of this kind; do not answer.

(*m*) De Ponto l. 1. Eleg. 4.
(*n*) Epist. 8. n. 26. & 29.

(*o*) supra ad n. 9. cit.
(*p*) Hist. de l' A. 1749. Obs. Anat. 4.

The Academy therefore ; in pursuance of that wisdom for which it is so respectable ; did not think proper, in an affair “ of such great moment,” to omit mentioning the history communicated thereto, but without interposing its own judgment on the subject.

And that history is certainly worthy to be read ; as it is written with accuracy, and confirms, against all who may doubt thereof, that they have written true things, who have asserted, that the poison of a mad dog had sometimes been introduc'd into the constitution without a wound ; and only by the foam being flabber'd upon the patient : the names of which authors I have, in a former letter (*q*), shown you where to find ; and you will add, besides others, the celebrated Piedmont professor Mazzucchelli (*r*).

I wish the time may come, wherein that, or any other equally simple remedy, may be sufficiently approv'd of, by frequent and long-continu'd experience : or even that remedy which the learned Arrigoni (*s*) has propos'd, while I was writing these things ; that is, arteriotomy in the back-part of the foot, perform'd in the manner he usually performs it ; which he shows by an observation he has added, to have had a happy event.

And although this observation is single, and the cure was not perform'd without the joint use of other remedies ; which several authors, and among these Morand, have been wont to exhibit ; yet you will readily read it over, as you will three others, in like manner, that relate to maniacs, who were dismiss'd from the hospital, in good health, both of body and mind, after having been cur'd by the same remedy ; if you except one, who was carried off by a phlegmon, within five days after he had been already restor'd to soundness of mind. For this phlegmon, beginning from the metacarpus ; which they had previously bruis'd by the iron chains, while he was furiously raving, and agitating himself with vehemence ; had extended itself from thence to the arm ; and from the arm to the shoulder, with great impetuosity and celerity.

And, while you read this, you will commend the advice of Valsalva, which I have formerly taken notice of to you (*t*) ; I mean, that patients, who are furious, should be bound by firm chains indeed, but not by chains of a hard nature.

However, in regard to the arteriotomy which has been recommended, I would not have you remain uninform'd, that the students here, having begg'd of me that I would order the artery to be laid open ; in that part of the tarsus where it is to be cut into ; we certainly found it to lie, in that body, not only under the common integuments, but also under the tendons, which extend the toes.

14. Before I make an end of writing, I think it may not be improper to mention a case, which was observ'd at Padua, in the year 1754, by a physician whose veracity is very well known to me.

It does not altogether relate to the hydrophobia indeed ; yet it relates to a disorder that has some affinity thereto, and has many circumstances seem-

(*q*) Epist. 8. n. 21.

(*r*) apud Morandium paulo ante cit.

(*s*) Dissertaz. della Mania &c. P. 3. c. 2.

(*t*) Epist. 8. n. 5.

ingly of a similar nature; as you will learn from his short narration, and from a very few animadversions, which I shall add thereto.

A cat, which was afraid lest a little whelp should do any injury to a kitten she had brought forth not long before, ran to encounter him. The master of the cat took up the poor little dog in his arms. But the mischievous cat fell foul upon her master's leg, at the lower part, with her teeth, and her claws; and wounded him a little above the tarsus anteriorly.

The master, for three days after, neither felt, nor fear'd, any harm; as the cat had not, either before, or since, shew'd the least signs of being mad.

But on the fourth day after the bite, he was seiz'd with so great an anxiety about the præcordia, that, being no longer able to endure it, he had recourse to the physician who related all these circumstances to me; and begg'd his assistance with such earnestness, and with such an appearance in his eyes and his countenance, that made him apprehensive of madness being very near at hand.

Leeches and cupping-glasses being therefore immediately applied to the wounds, (on which was laid for a long time after, by the particular desire of the patient, that exotic stone they call *cobra*) and blood being more than once taken away, from the upper and lower limb, on the opposite side; as the fullness and strength of the pulse requir'd; and a great quantity of water being frequently given, which the man drank without any repugnance or difficulty; and yet these remedies, and others, not having been of the least effect; and even a slight delirium having come on; there was only one remedy which would relieve his anxieties: and this was a water-bath made use of in such a manner, that, as often as ever these anxieties were troublesome, the patient, of his own accord, threw himself therein; which he often did; for it was a warm season of the year.

Last of all, being seiz'd with a considerable fever, though but of short continuance; and having sweat to a great degree; he seem'd now to be quite well on the 14th day after the bite.

But at every full-moon after that time, from the place which had been bitten; and which, as the wounds had been too hastily heal'd up, was surrounded with a livid colour, in the manner that a contus'd place generally is; he began to feel certain irritations arise, which, as soon as they had reach'd up to the præcordia, brought on those same very great anxieties that he had before experienc'd: and he could not be freed therefrom, but by losing blood from a vein.

After these symptoms had return'd in the same manner, and at the same time, quite to the two-and-twentieth month, they began to return at every fourth full-moon only: and this period they still kept in the fourth year after the bite had been receiv'd; that is, the time of my writing this letter.

15. If you except dogs; I do not remember to have read of hydrophobias, or violent injuries of this kind, having been brought on more frequently, in general, by any animals, than by cats.

But if to dogs and cats only those follicles were given, which emit a kind of strong-smelling fluid to the anus; a very considerable confirmation might be taken from hence, of the conjecture of those persons, who recount, among
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the causes from whence dogs become mad, an obstruction "of the sacculus;" and even of the sacculi; for there are two that contain this foetid matter, "which seems to be the most acrid part of the humours; so that if it be re-absorb'd into the blood, or be less properly secreted therefrom," it becomes capable of generating every very violent disorder.

And that this humour is certainly endow'd with a great power of irritation, I have several times been convinc'd; but particularly when, in dissecting a weazel, and in discharging the fluid from those sacculi; which it had very large in proportion to its own size; I immediately perceiv'd my nostrils to be struck with a kind of acute *odor sylvestris*, so that it seem'd to resemble nothing more than the odour of burning sulphur.

These sacculi, however, are not given to weazels only, but to a great number of other animals also; as you have already read (even before others, and in particular Peyronnius (*u*), had shewn them to exist in the *moschiferous animal*) in our *Adversaria* (*x*); so that it is not surprizing it has been since written, by men of eminence, "that they are found in almost the whole genus of quadrupeds;" or, at least, since many species are, nevertheless, to be excepted, "most of all," as the celebrated Fantonus says (*y*), "in carnivorous quadrupeds, and such as have claws."

That cause, therefore, of canine madness being set aside; if we consider the thing itself only, it is scarcely to be doubted, but after dogs, cats bring on a hydrophobia, as I just now said, or injuries approaching to the nature thereof very nearly, more than other animals.

Scaramucci (*z*) has three examples of this kind: that is to say, in two women, and in a presbyter; Brogians two (*a*); one in a priest, and another in a certain man: Lindernius (*b*) one: and, not to be too tedious, Stalpart alone (*c*) had produc'd nine examples, of persons being infected with canine madness by cats, and kill'd thereby; the first of whom he himself had seen, and the others Amatus, Hildanus, and Zacutus, had mention'd.

Nor was an example wanting at Padua, some years ago, in a nobleman; who, like the priest of Brogians, begg'd of those who came to see him, to stand at a distance from him, lest he should bite them; thereby confirming what more than one physician had admonish'd: I mean, that all patients, affected with a hydrophobia, are not delirious.

But if you should be willing to examine most of the examples I have refer'd to; you will moreover know, that it had happen'd more than once, that no-body could contend for the disorder's having arisen from fear; as the persons were ignorant that the cat, who had attack'd them, was mad: and they were not seiz'd with the madness till many months after, when they had almost forgotten the accident; as in the observations of Stalpart and Hildanus.

And indeed those two men spoken of by Lindernius and Brogians, seem to have been ignorant, and unapprehensive; particularly the second; as he

(*u*) Mem. de l'Acad. R. des Sc. A. 1731.

(*x*) IV. Animad. 29.

(*y*) Dissert. Anat. Renov. 4.

(*z*) Supra ad n. 11. cit.

(*a*) P. 2. ibid. cit.

(*b*) Commenc. Litter. A. 1735. Hebd. 11. n. 2.

(*c*) Cent. 1. Obs. 100. & in Schol.

was bitten by a cat which he struck : so that the animal seems to have been provok'd by anger, rather than by madness, as in the case I have related (*d*).

And to the same case relates, in some measure, that which happen'd in the presbyter of Scaramucci ; I mean, that a streightness of the fauces, from which he had soon escap'd, return'd, " for many years, at the same time of " year " wherein he had been attack'd by a mad cat : though this animal had left an impression of its teeth only, without any laceration of the skin whatever.

But two other examples, of the same authors, relate thereto still more.

For, in a woman ; of whose, and of other similar cases, I have spoken too briefly in the eighth letter (*e*) ; the first signs of a hydrophobia discover'd themselves, when from the wound, which was already shut up, " she felt " a kind of ray, as it were, moving upwards through her arm, towards her " breast, with an inflammatory sensation."

And in a man ; who was one of the three bitten by the same dog, and who liv'd about four years after two had died from the same cause ; out of the wound, to which a red-hot iron had been applied ; for it had never come to cicatrization ; a great quantity of blood was discharg'd every year, at the time wherein the wound had been inflicted ; " till a vein was open'd in the " tibia, where the wound had been receiv'd."

And now, since I have made mention of the mad dog also ; besides other observations relating hereto, I would have you read that which Roscius has given in the works of Hildanus (*f*).

You will see how many, and how violent symptoms ; except that the drinking of water was never refus'd ; were suffer'd by a matron, after a very severe pain of the arm, which had been bitten by a mad dog seven years before ; and, in like manner, after as many more years, the beginning of her disorders always arising from the same arm ; and a third time after the interval of six years ; then after one year only, twice in the following year, and three times in the year succeeding that ; but with this peculiarity, that the more frequent the attacks were, the more short they were also.

After the wound had been receiv'd, a great number of remedies had been immediately applied thereto ; but after these applications the wound was brought to a cicatrix.

And as this closing up of the wound succeeded very badly also with the woman mention'd from Scaramucci ; and as the contrary treatment was very advantageous, to a man of whom it is said, from his observation, that the wound never coalesc'd ; it may easily appear that the monitum of all those, who have taught that the wound should be kept open a long while ; and if it happen to be shut up too soon, should be open'd again ; is a very excellent rule to follow.

And as we have recommended this practice (*g*) in a former letter ; so I could wish it had been made use of in the case which I have related to you lately.

(*d*) N. 14.
(*e*) N. 21.

(*f*) Cent. 1. Obs. Chir. 86.
(*g*) Epist. 8. n. 26.

16. However, as the same case, join'd together with others, which have been formerly produc'd (*b*); and particularly with those that have been just now taken notice of by me; confirms what I have conjectur'd in regard to the communication of this poison by the nerves, and the convulsive nature of it, in a very considerable degree; so the one instance of relief, from a water-bath, agrees with those things which I have before thought proper to say (*i*), of the use of a remedy of this kind, not deserving to be entirely despis'd: and the advantage which result'd from a large discharge by sweat, confirms what has been asserted on this subject, both by ancient and modern authors.

The chief of whom; that I may not take up your time in mentioning them here particularly; will be sufficiently shewn by that Edinburgh dissertation which I have commended above (*k*). Farewel.

LETTER the SIXTY-SECOND

Relates to Epilepsy, Convulsion, and Palsy.

NOW take the remaining observations, which relate to the three other violent disorders of the brain, and nerves; epilepsy, convulsion, and palsy.

As to the epilepsy, however, I should have no observation to add here, if I were not unwilling that should be lost, which was communicated to me at Venice, about the year 1708, by my respectable friends, whom I have already mention'd to you with encomiums, Alexander Bonis, and John Jerom Zanichelli.

2. A young man, of two-and-twenty years of age, was seiz'd with a fever without any manifest cause; nor did he complain of pain or uneasiness in any part but in the head. To this were added epileptic paroxysms; which brought on death within twenty-four hours after the beginning of the fever.

When the cranium was open'd, no diseas'd appearance was found anywhere, if you except a mucous serum; which, being collected upon the anterior part of the cerebrum, betwixt the dura and pia mater, had drawn these membranes to a considerable distance from each other, and had compress'd the cerebrum.

(*b*) Ibid. n. 21. & 32.

(*i*) Ibid. n. 29.

(*k*) N. 9.

The stomach indeed appear'd to be inflam'd: and a conglomeration of round worms was found in the first intestines. But there had not been the least symptom of these appearances.

3. Whether the pain of the head was so great as to "obscure" the pain of the stomach and intestines, as Hippocrates (*a*) says, or not; at least his other aphorism (*b*) is confirm'd, by death being the consequence of convulsions, that come on in a feverish patient.

But as these convulsions made a disorder, which would not have been so short from its own nature, very short; what could be the cause of their being so vehement? Was it the worms irritating the small intestines? I should believe it, if any uneasiness in the belly had preceded, the pain of the head.

But what cause had produc'd this last-mention'd pain? Was it the fever? Whatever the cause of it was; if we acknowledge it to be very violent; we shall not wonder that the blood was, from thence, obstructed, or at least detain'd, in the vessels of the meninges; and that the serum was separated therefrom.

And as we have shown in a former letter (*c*), that an epilepsy may be brought on, even by a less quantity of serum than was found here; there is not the least occasion to repeat, at present, what you may read over again in that letter.

And if you examine Bohn (*d*), where he tells you what appear'd to him, in a boy of ten years of age, whose body he dissected; and who, while living, had labour'd, "first under a very great pain of the head, after that "under an epilepsy, and a stupor of all the senses," in which state he died; you will easily conceive what that very learned man seems to have thought of serum, or rather, if you please, of lymph, even when not extravasated, but stagnating in the vessels round about the convolutions of the brain.

4. Let us go on to convulsion. For epilepsy indeed cannot be without convulsion: and convulsion is very often without epilepsy; as it was in that person also whose history I shall immediately subjoin.

5. A night-man, who was about fifty years of age to all appearance, of a robust habit, of a good colour and constitution, but rather inclin'd to a plethora; being given to liquor, and frequently drunk; was busied, together with his servants, in cleaning out the jakes of the hospital, at an unseasonable time of night, as the custom of such persons generally is.

And as they were going to and fro, every now and then, as that filthy business requires, the master himself thought, once when he happen'd to be alone, that he saw a spectre cloth'd in white; and being immediately seiz'd with a trembling of his whole body, and, at the same time, with a distortion of the mouth, was found in this state by his servants when returning, and carried to bed immediately.

Antispasmodics and cardiacs being instantly given; whereby the tremors grew milder, and strength return'd to the pulse; blood was taken away from the arm, to the quantity of six ounces, the same night.

(*a*) S. 2. Aph. 46.

(*b*) Ibid. Aph. 26.

(*c*) IX. n. 10. & alibi.

(*d*) Dissert. de Trepanation. Difficult.

And, in the morning, as large a quantity was taken from the other arm; when the tremors had grown more inconsiderable, and the pulse was expanded and become febrile.

And even on the following day, a vein was open'd in the foot; some alleviation, though but short, being gain'd by each blood-letting; and the blood, particularly at the first time of opening a vein, coming out in a frothy and very black state; the crassamentum being somewhat hard, and the serum only in small quantity.

The fever continu'd: and instead of the *clonic* convulsions, the *tonic* were exceedingly troublesome, every now and then, in the whole body.

The man could not speak so as to be understood; nor did he speak intelligibly, from the time of relating to his servants what had happen'd to him.

Yet he plainly shew'd that he knew the persons about him, and could distinguish them one from another: and when he was able, he signified, by means of gestures, that he was troubled with a very oppressive pain of his head. And by the effect of these disorders; against which other external and internal remedies were made use of in vain; he died within six or seven days, and on the last day of January in the year 1747.

The carcase being brought into the college on the following day; in order to finish the public anatomy of the year; the arms indeed were not rigid, but the fingers were extremely rigid. The penis and scrotum were of a blackish colour, but only on their surface.

The belly being open'd; and the omentum, which had very little fat, being taken away; I observ'd the intestine colon; which was almost every where tumid from included air; to have such a direction, that, after having gone up to the liver, it went down from thence below the navel, to the extent of two or three inches on the right side of the navel; and, on the other hand, when it had return'd to its usual situation, and had kept its natural course, in a transverse direction under the stomach; had pass'd in an oblique direction, in the left part of the left hypochondrium, and in a strait direction, over the whole anterior surface of the subjected kidney; it return'd from thence, into the same hypochondrium; going down from whence, and entering the pelvis, it degenerated into the rectum intestinum without any flexure.

The small intestines; if you except some tracts thereof, and among these not an inconsiderable part of the ileum, which went down low into the pelvis; were distended with air: and a yellowness, with which they were internally ting'd, was seen through their coats.

For as the bile, wherewith the hepatic cyst was almost fill'd, had, by exuding, made the neighbouring intestines externally yellow; so, by flowing into them, it had made their internal surfaces yellow likewise.

The liver, however, was of a blueish colour, as the spleen was also; but although, at the edge of the former viscus, that colour was very much saturated, in no place did it go beyond the surface; nor yet in the spleen. The spleen was of a middle size; but the liver was large: yet both these viscera were found.

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The thorax being open'd, the lungs; which adher'd to the pleura but slightly, and in few places, and these on the back-part; were rather turgid, and shew'd, in some places, pretty large areas, which were somewhat more elevated than the rest of the surface; and in which a kind of vesicles, as it were, evidently appear'd to be included. There was not any intermediate lobe on the right side, but the appearances were the same there as on the left.

The pericardium being open'd, I found no fluid therein, not even a drop; notwithstanding the internal surface of it was still moist, so as not to adhere entirely to the heart, it already began to adhere, in a manner, in some places.

In the heart was but very little blood; perhaps because it had flow'd down previously, at the time of cutting through the large vessels beneath the diaphragm; especially as the blood was observ'd to be fluid, in several places, in this body.

Yet I found two polypous concretions, one of which went, from the right auricle, into the vena cava superior; and the other, which was somewhat more considerable, from the ventricle of the same side, into the pulmonary artery; being round, and thicker than a man's little finger.

Finally, when the cranium and the dura mater were cut into, nothing worthy of remark occur'd. But the pia mater had its vessels so full of blood, that even the smallest branches appear'd, in every part, as if they had been fill'd by injection.

They were full also in the ventricles, and even within the medullary substance of the brain: and when I compress'd, gently, the beginning of the spinal marrow, which had been taken out together with the medulla oblongata; I observ'd not only that blood issu'd forth from the fissure of that marrow, but also from the section of the substance itself, which was nearest to the fissure.

In both the lateral ventricles I found a pretty considerable quantity of limpid water; yet the plexus choroides were red: and therein were not vesicles, as there generally are, but very small red particles; and these solid, so as to seem glandular.

The cerebrum and cerebellum were of a natural firmness; but the fornix was lax: the crura medullæ oblongatæ, and the trunk thereof, were lax: but the last-mention'd parts only on their internal surface.

Nor indeed will I omit to mention an appearance, which; like some other things describ'd to you from this dissection; relates to circumstances that are less common indeed; but such as are to be deduc'd from the original conformation, and not from disease: that is to say, the anterior lobes of the cerebrum, where they are contiguous to one another, had, at the middle nearly of their height, some part of their surface; which was, in other respects, convoluted in the manner of the intestines; so form'd, that the one was receiv'd, and the other was the recipient in that part.

6. What effects even a vain terror can produce, is shown by the history in question. You see that instantly, both the clonic and tonic convulsions, as those at the mouth, arose from the disturb'd motion of the spirits; and, by detaining the blood in the vessels subservient to the brain, and by this means bringing on an effusion of serum, certainly brought on new causes, for which

these very convulsions continu'd even to death; unless you should rather choose to suppose that limpid water to have been effus'd into the lateral ventricles, from a compression of the vesicles, moreover, which had previously existed in the choroid plexusses; as we frequently see; the remains of which, perhaps, when burst asunder, and contracted into themselves, represented those kind of glandular bodies; as might have appear'd to anatomists formerly, and from similar causes likewise; whereby they were led to acknowledge glands, of this kind, in these plexusses.

Of which things; as those that have sometimes equally occur'd to my mind, although I would not perhaps be of quite a contrary opinion to you; that, however, which I have said of the blood being retain'd, is so much the more credible, in proportion as this fluid was in greater quantity, by reason of the patient being a drunkard and plethoric; and in proportion as the alleviation of the disease, brought on by every blood-letting, was more evident though short; and in proportion as the distension of the vessels, even the smallest vessels, of the brain, was more manifest; as it was perceiv'd to be in a very great degree, even from the compression of the spinal marrow: for very seldom is it possible to press the blood out of the very substance of that marrow.

Add to this, the acrid particles which get into the blood of a man employ'd in so fordid an art; so that those which should be discharg'd, during the detention of this fluid, might irritate and vellicate the more.

But in regard to epilepsy and convulsions, enough; especially as many things remain to be added upon the subject of the opposite disorder, that is, paralysis.

7. An old woman; less than eighty years of age, but more than seventy; was suddenly seiz'd with a very violent apoplexy. She was immediately brought into the hospital, with a stertor upon her, a weak pulse, and, what most relates to the point in question, with a paralysis of both limbs.

And there she died within two days, at the same hour the apoplexy had come on; which was after the middle of March, in the year 1750.

The upper part of the cranium being saw'd round about, the next day, and nothing having been discharg'd; before it was rais'd up, I said, in the hearing of a large circle of students, that, although by reason of the constitution of this old woman, and her manner of life, and the disorders to which she had been liable, being unknown to me, I did not take upon me to determine, for a certainty, what we should find to have been the cause of the apoplexy; yet I would not deny, that, even in a woman of this age, it might be from blood; especially as the veins in her neck were very tumid therefrom, and the apoplexy had been violent: but whatsoever had been the cause, so that it consisted in any conspicuous injury of the organs; that it might be conjectur'd, with great probability, from the paralysis of the right limbs; according to the many observations of Valsalva, and mine; that it would appear in the left hemisphere of the brain.

Then pulling off, from the subjected meninx, the arch of the cranium; and seeing no morbid appearance in that membrane, but observing, soon after, the greater part of the vessels which creep through the pia mater, to be turgid with black blood; and finding a little bloody water about the

lower terminations of the medulla oblongata; I came to the dissection of the cerebrum, which was firm; whereas the cerebellum was lax.

And first opening the lateral ventricle on the right side, a considerable quantity of water offer'd itself to our view; which circumstance might seem to indicate something that did not correspond to the observations mention'd just now.

But as, in the whole of that ventricle, I saw nothing ruptur'd or lacerated; except some part of the septum lucidum; we went on to open the left ventricle.

And the whole of this cavity was fill'd, in part with the same bloody water, but in part also, and particularly towards the back part, with a considerable quantity of black blood; and that coagulated.

And from hence it was evidently perceiv'd, that this bloody water had been press'd out from that blood, while in the act of concretion; and had made a way for itself through the septum which divides the ventricles one from another, from the left of these cavities into the right; which had no appearance worthy of notice, except that the choroid plexus was somewhat pale; and distinguish'd with a great number of hydatids, where it was inflected in an anterior direction: these hydatids, however, were of a small size only.

But in the left ventricle, the plexus choroides had been so injur'd, by the eruption of blood, that it was not possible to distinguish clearly, what the state of it was.

This blood had burst out from a large cavity to which it adher'd; which cavity was hollow'd out in almost the whole of that part of the lacerated corpus striatum, which is extended from the middle of the length thereof, to the posterior parts; and, at the same time, in the lacerated and contiguous thalamus nervi optici, and even almost in the whole of it; for but a very small portion of this body, and that of a lurid colour, was remaining at the border of the third ventricle, which was full of that same kind of bloody water: and, on the other side of the same thalamus, the discharge of blood had lacerated not only the thalamus itself, but some contiguous part also of the left hemisphere.

Having carefully dissected the other parts within the cranium, and found them all in a natural state; so that even the arteries had nothing hard in their coats; I nevertheless found, that almost all the other arteries, and even the carotids themselves, in the upper part of the neck, were not without bony lamellæ in this old woman.

Nor did I, in demonstrating and cutting into the spinal marrow, in its situation, on the following days, find any thing which was preternatural.

The viscera of the thorax also, and the belly, offer'd nothing worthy of remark; if you except the colon, which was inflected, from its situation, downwards, in the form of an arch; and that for a considerable space: and it was, as the stomach was also, very much contracted.

A corpuscle likewise was observ'd in one of the axillæ, of the form and magnitude of a lupin, and of a middle nature betwixt bone and stone; which corpuscle, if it had not been more near to the pleura than the axillary glands; you would perhaps have suppos'd to be made up of one of them.

8. This dissection, as well as a great number of others, has confirm'd the aphorism of Hippocrates (*), which says, that "to solve a violent apoplexy is impossible;" and, at the same time, confirms the dogma of Valsalva, whereof I have so often spoken, and which I have mention'd above: and it has moreover shown us, how destructive is an extravasation of blood from the corpora striata, or the neighbouring thalami; or at least from the parts thereabout. All which hypotheses will also be confirm'd by the next history.

9. A woman, who was already hoary-headed, died about the middle of December, in the year 1756, in the same hospital, and of the same disease; a palsy having been observ'd in her right limbs.

Being about to cut into the cerebrum in its situation; and having predicted the same thing, as in the former woman, to those students who remain'd in considerable numbers, after I had finish'd a general lecture upon the bones; I remov'd the dura mater, and shew'd the vessels, which run through the pia mater, to be very full of blood on the left side; where, also, something similar to jelly appear'd under that membrane.

Then cutting into the cerebrum, the substance of which was firm; whereas that of the cerebellum was very soft; and having seen a little water in the lateral ventricles, but none in the right hemisphere, nor yet having found in any other of those parts that are contain'd in the skull, the least appearance which was contrary to the common order of nature; on cutting deeply into the left hemisphere, in a longitudinal direction, I found black and coagulated blood to the quantity of two ounces, as we all of us judg'd.

This blood was effus'd at the side of the corpus striatum, and under this very body, within the medullary substance: and although it had lacerated this substance, yet it had open'd no passage, for itself, from thence, whereby it might come into the neighbouring ventricle; or on the outside of the cerebrum. Being busied with other pursuits, I dissected no other part of this body.

10. Thus far had I written on the first day of January, in the year 1758, when, returning to the hospital on the following day, in order to resume the interrupted anatomical exercitations, I immediately had an opportunity there, of making another observation, which must be join'd to those of Valsalva's that I have commended.

11. A beggar, of about fifty years of age, whose spine was in the preternatural state I shall describe below, had fallen down in an apoplectic paroxysm a month before, when he was in the market-place; he also having his right limbs paralytic, and his mouth distorted.

Being immediately receiv'd into the hospital, and venæsections, and other usual remedies, being made use of; he had so far receiv'd advantage as to be able to speak a little. But after some days had pass'd, he was again seiz'd with an apoplectic paroxysm; and was again reliev'd by medical assistances. And finally, by a third attack he was carried off.

In cutting the cranium round about, and pulling it away from the dura

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mater, which adher'd to it very closely; nothing worthy of notice having been discharg'd, and I having predicted as usual, to my circle of auditors, which was very much crowded; the event confirm'd my prediction.

For by dissection there was no-where found any morbid appearance within the cranium, except in the left hemisphere of the cerebrum. The internal medullary part of which hemisphere; that was adjacent to the lateral ventricle, being separated by blood; contain'd such a quantity of fluid, in a black and half concreted state, as a spoon of a middle size would scarcely contain.

But the spine of this man was so inflected, that I do not remember ever to have seen it more so, in any body. For, at the lower vertebra of the thorax, it was so bent to the right side, as to make an angle downwards which was less than a right angle; and, at the same time, turn'd the bodies of that vertebra, and of four or five of the vertebræ that lay upon it, to the left side; so that they did not look towards the anterior paries of the thorax, but entirely towards the left side.

Indeed the inflection, which was seen in all the vertebræ of the loins, in the upper vertebræ of the thorax, and the lower ones of the neck, was much less than that I have describ'd.

Nevertheless there was a manifest inclination of the spine, on both sides, that resembled a bow; the convexity whereof was, in the loins, on the right side, and the concavity in the left; and in the upper part of the back, and the neighbouring cervix, the convexity was on the left side, and the concavity on the right.

Finally, I observ'd the ligament, which embraces posteriorly the process of the second vertebra of the neck, that is call'd *processus dentoides*, or tooth-like process, within the first vertebra; and in the manner of half a ring; to be grown into one substance with that process; and particularly on the right side: perhaps in consequence of the continual, or at least the very frequent, position of the head, which was more commodious to a man thus form'd.

12. In proportion as this deprav'd figure of the spine, which I have describ'd, made an inflexion upon the great artery that adher'd thereto; so much did it resist the ready and easy flux of the blood towards the inferior parts of the body. The consequence of this therefore was, that a greater quantity was sent from thence to the brain; whereby a disposition to a sanguineous apoplexy was brought on.

Yet this was prevented from being more speedily fatal, not only by those two protuberances, in the basis of the ventricles, being uninjur'd, but by venæsections also opportunely applied; for by these it was, without doubt, brought to pass, that the injury should not be continu'd to those protuberances; and that the effusion of blood should not be brought on, but slowly, sparingly, and at intervals.

13. And how very frequently I have found the injury, in this species of apoplexy, in that hemisphere of the brain, which is opposite to the paralytic side, not only these observations, but a great number of others, made by us, confirm; and although the greater part of these I have pointed out, or

or propos'd, in other places (*e*), yet there are some, nevertheless, which remain; and among these one that I shall send you in the next letter (*f*).

And not only our observations, but the observations of others also, which have likewise been referr'd to in other places (*g*); to which you will add that quoted by the celebrated Sulzerus (*h*) from Archibald Adams; and those which Mead (*i*) asserts to have been made by him "formerly, more than once, in the hospital;" and the observation, at length, which occur'd to that very experienc'd man Marc Anthony Caldani (*k*), and which is very similar to ours; when after a violent apoplexy, and a paralysis of the whole right side, he saw the left corpus striatum eroded in one half of its substance, and full of grumous blood.

Yet there are some observations, also, of that side which is opposite to the injury not being paralytic; and of that side which is subjected to the hemisphere of the cerebrum, wherein the disease is, being resolv'd.

I confess there are: nor did Valsalva (*l*) dissemble it among his observations; nor do I dissemble it among mine (*m*). Nay, in my anatomical epistles (*n*) I have produc'd seven, that are taken from the books of other authors.

And if, with these, you should be willing to reckon one from the excellent Bergenius (*o*), and one or two that you have in the already commended Sulzerus (*p*); I shall say nothing against it: yet I will beg of you to consider those things which may be replied to many of them: and this I have done to some of them (*q*), as Sulzerus (*r*), who had not seen my anatomical epistles, did afterwards to others; although you may suppose there to be some, to which no objection can be made: and I will likewise beg of you to compare the very small number of these, with the almost innumerable ones of Valsalva, and others.

For by this means you will immediately understand, to which of the two classes of observations, a physician, who considers what happens for the most part, is to have the greatest regard, and upon which he ought most to depend; and not only in theory, but in practice likewise: so that if, in particular, as Sulzerus (*s*), whom I have often mention'd, takes notice, the trepan is to be applied to the skull after having receiv'd a blow, by reason of blood, or pus, being extravasated underneath; and to the other symptoms a resolution of one side be added; we may from thence argue the seat of the compression, which has taken place in the cerebrum; and consequently the seat of the extravasation, whereby this compression is occasion'd.

14. And as to what relates to the cerebrum; I have said enough on that head.

(*e*) Epist. II. n. 10. & seqq. III. n. 2, 3.
14. & seqq. V. n. 7. XI. n. 10. 12. LI. n. 43.

(*f*) Epist. 63. n. 12.

(*g*) Vid. easd. epistolas.

(*h*) De Actione Cerebri decuss. § 8.

(*i*) Monit. Med. c. 2. § 2.

(*k*) Lettera sull' Insensitiv. &c. § 51.

(*l*) Tract. de Aur. Hum. c. 5. n. 5.

(*m*) Epist. 57. n. 14, 15. & Epist. Anat. 13, n. 23, 25.

(*n*) Ibid. eod. n. 25.

(*o*) Ventriculor. Lateral. Cerebri nova Tab. not. *dd*.

(*p*) § 13.

(*q*) Vid. Epistolas indicatas.

(*r*) § 16. & seqq.

(*s*) § 21.

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But what if the injury reach to the cerebellum? The question then is, whether, if this injury be in one or other, or about one or other, of the lobes of this body, it bring on an hemiplegia; and if it does bring it on, whether in the opposite, or the subjected side, of the body?

This problem I have propos'd in the third of my anatomical epistles (†): nor am I sorry that I have made it my general custom, which I even then adher'd to, to determine nothing from any one observation; nay indeed, as I there confess'd that this observation may be explain'd in various ways, I admonish'd that we ought to wait for other observations, and observations of a different kind.

For I afterwards lit on an observation of a less modern date, and read another new one, in both of which the hemiplegia; corresponding to the injury in one of the lobes of the cerebellum; was in the limbs of the subjected, and not of the opposite side.

These observations I have spoken of to you in other letters (u): although, admonish'd by those varieties, which have sometimes occur'd in contradiction to the very dogma of Valsalva, which is otherwise confirm'd by a great number of clear and consistent examples; I thought it the most safe and prudent method of proceeding, not to determine any thing very hastily even from two examples; but previously to add thereto still others and others, which might shew the same thing: for this Valsalva did before he made his opinion public.

I am not ignorant; if you should chuse to take the whole of the circumstances into consideration, as you ought to do; that these examples occur more rarely than those which relate to the cerebrum; as you may have learn'd from the remarks that I have made, in regard to a certain observation of mine (x), wherein I have found no very small cavity within one lobe of the cerebellum, and that very full of blood: and you may learn it from a second observation that I have promis'd you there; and in another place also (y); and this I will immediately communicate.

15, A man, about eight-and-forty years of age, who had been accustom'd to make use of lighted charcoal, even more than his business, which was that of a cook, requir'd; and to stand very near to these fires with his head over them; had begun to complain of very acute pains in that part a year before.

To these pains was added a debility of both the lower limbs likewise, to so great a degree, that he could no longer support himself upon them. In consequence of which affection; and those pains, join'd with a slight fever that had lately come on; being oblig'd to confine himself to his bed, and, finally, to send for a physician, blood was first drawn from his arm, and then from his foot; and that for this reason also, that he now-and-then labour'd under a slight delirium: and the fever indeed was solv'd by this means; but all the other symptoms continu'd.

The physician being dismiss'd, he went on to make use of the cephalic remedies that he had order'd; but so far to no purpose, that, after having

(†) N. 23.

(u) Epist. 52. n. 27.

(x) Epist. 60. n. 7.

(y) Epist. 52. n. 26.

kept his bed at home for four months, being afflicted with all the disorders that I have now mention'd, and for that reason, at length, brought into the hospital, he there liv'd no more than ten days.

His pulse was tense and vibrating; though in other respects moderate and never febrile. His respiration was natural, as his appetite for food also was. And although the lower limbs, as far as motion was concern'd, were paralytic; yet neither the upper limbs, nor any other parts of the body, were attack'd with an affection of that kind.

In the day-time he slept for the most part; but in the night was, in a slight degree, delirious. Venæsection having been made use of in the arm amongst other remedies of no effect, and a few days after that, venæsection in the foot also; it happen'd that he died on the following night, without having given any signs of his approaching dissolution, through the whole of that day: and indeed, having taken his dinner, as he had been wont to do, and even a part of his supper in the beginning of the night, it was suddenly observ'd that he was giving up the ghost.

When he was in his perfect senses; as he was at intervals, though not at all for the most part; he us'd to say to his sister while he was at home frequently, and had said to others, while he was in the hospital, that he wish'd his skull might be open'd after death; in order that the cause of his violent and obstinate disorder might be found out.

And this was done by me on the following day; that is, on the eighth of January, in the year 1754; being attended, during the dissection, by many who had remain'd in the hospital-theatre after the anatomical lecture was finish'd.

While the head was cut off, and the skull cut open, a quantity of water had flow'd out. Before I cut into the brain, and still more after I had dissected it, I shew'd that the cavity of the cranium was oblique in this man; and that the left side of it, particularly at the posterior part, was more distant, and that considerably, from the middle, than the right.

The vessels which creep through the meninges, and through the parietes of the lateral ventricles, had a greater quantity of blood than they naturally have: and this was demonstrated, in respect to the small vessels which pass through the medullary substance of the cerebrum, by the bloody points being more than usually conspicuous.

That substance indeed was pretty hard in the hemispheres. On the other hand, the corpus callosum was lax. But the former, and the medullary tract, which is drawn before the columns of its basis, were still more lax; and those columns lax in a very great degree; so that their substance might seem to be dissolv'd. The corpus striatum, on the left side, was more lax, also, than the right. But the septum lucidum was pretty firm.

In the three anterior ventricles was a great quantity of limpid water; and therein the alæ of the plexus choroides floated, but were not of a pale colour. The pineal gland; which was distended with the same water, and easily ruptur'd, in raising up the middle part of those plexusses; left nothing of itself behind, but a very small part of its basis; which was affix'd to its seat.

The third ventricle seem'd to be shorter than it naturally should be; but

the fourth ventricle certainly appear'd to be longer than it generally is, after the cerebellum had been cut through the middle, in the usual manner, and laid aside on one hand and on the other.

And in cutting this substance in the manner I have said; I found a circumstance of disease, which the surface thereof, that was similar to what it generally has, did not so much as suffer me to suspect.

That is to say, no sooner had I proceeded, with the knife, to the depth of a finger's breadth, but, perceiving an unusual resistance, I stood still, and drawing asunder that part which I had cut into, was very much surpriz'd that no mark of the medullary tree or shrub appear'd; but that in its place were parallel medullary striæ, drawn betwixt the cortical substance: from which striæ no small branches were, in any place, sent forth.

Then attempting the division with a sharper and stronger knife; whatever remain'd of the middle substance of the cerebellum, I cut asunder, quite down to the fourth ventricle; and began to see that disorder, on account of which, chiefly, I describe to you this observation.

It was a substance not soft, not of two colours, nor cut betwixt with deep and very frequent sulci; but a schirrhous substance, and of one colour, which approach'd pretty nearly to that of a very dilute flesh-colour; being made up of roundish corpuscles, as it were, so compacted one with another, that there no-where occur'd any interstice, no membrane, no sanguiferous vessels.

A disorder of this kind extended itself, on the one hand, towards the right side in some measure; and, on the other hand, through almost the whole left lobe of the cerebellum.

For if you excepted the surface of this lobe, which was made up of its natural substance; that was in some places very little, and at the lower part none at all; all the remaining part was occupied by just the same disorder: and at the lower part in particular it was closely connected with the dura mater; so that the disorder might be suppos'd to have taken its origin from that place, and to have been propagated, from thence, into the other parts whereof I have spoken.

And the right lobe, although it consisted of a soft substance, and that double, also; I mean a cortical and a medullary substance; nevertheless did not shew, when cut into transversely, that disposition of both these substances, which it is wont to do in other bodies; but a disposition evidently different therefrom: although not to such a degree as that middle part of the cerebellum; which, where it was soft, and made up of a double substance, offer'd sections so very different from what we have always seen, as those of which I have just now given you a description.

Nor could I observe any thing more that was contrary to the ordinary appearances of nature; notwithstanding I dissected all the parts accurately, and in their situation likewise.

But I had no time to examine any other part in this body.

16. From what part this schirrhous of the cerebellum might seem to have taken its beginning, has been already hinted. But whether it began on the left side for this reason, that the cavity of the cranium was there immoderately large; I shall no more take upon me to say, than from whence the unusual disposition

disposition of the medullary substance; through the right lobe, and that middle part of the cerebellum; took its rise, or occasion.

For that the case had been thus from the original formation, or from birth, does not seem credible, in him who liv'd seven-and-forty years without any complaint of his head.

It is rather probable; to pass on to other things; that as the schirrhous disorder increas'd, and less and less blood was admitted into that whole part of the cerebellum, wherein were no longer seen any of the great number of vessels, which go down here and there deep betwixt the segments (here entirely obliterated) in all bodies; so much the greater quantity of blood was propell'd both into the external, and into the more internal, vessels of the cerebrum; and that, from thence, not only the pains, but the frequent slight deliria arose: and finally, that from thence, when at the same time a great quantity of water flow'd down upon the cerebrum, death was brought on.

All which circumstances might the more easily happen, not only on account of the business wherein the man was continually occupied; and his too incautious method of exercising it; but also on account of that deprav'd disposition of the brain, to which the other circumstances had been added: and this disposition is shown by the irregular figure of the cranium; whether this was brought about in the uterus, or in its exit therefrom.

For I believe that this happens very frequently when, in a difficult birth of the infant, the head thereof is long detain'd in a streight passage; and the unskilful and regardless midwives; after having deform'd, by a rude and unequal pressure, the head which they had violently laid hold of, and dragg'd forth; are either entirely ignorant how, or do not take any care, to restore it into a natural form, by a proper and gentle application of the hands.

And how much injury then arises to the tender structure of the cerebrum and cerebellum; and not then only, but afterwards also; when, by increasing within an ill-form'd cranium, it is under a necessity of accommodating itself to the figure thereof; you will, without doubt, readily perceive, though I should say nothing on the subject.

Nor because, when I found a similar conformation; except that the cavity of the cranium was larger in the occiput only, and not on the left side, but on the right; in another man (z), I did not know that the man had been subject to disorders of the brain; nor yet that an old man, dissected by me in the hospital, about the beginning of the year 1755, whose forehead was so prominent on the right side, and his occiput on the left side, that the longest axis of the cranium was very oblique; nor that this old woman, I say, had been subject to any such disorders; will you, therefore, of course suppose, that they were not liable thereto: for it is not easy, in regard to obscure and unknown plebeians, to learn after their deaths all the complaints they suffer'd while living.

Nay, rather see in what state the cerebrum was in two women; one of whose skulls (a) I found to be in a state of male-conformation, as in the

(z) Epist. 53. n. 26.

(a) Epist. 1. n. 14.

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man; and that of the other (*b*) ill-form'd, as in the old man; and read with what severe pains of the head the first was troubled: to the obstinacy and long continuance of which, how much a deprav'd figure of the head contributes, you will even learn from the opinion of others (*c*).

Add to these the little boy (*d*), the posterior part of whose cerebrum seem'd not to approach to the figure of a sphere; but rather to the superficies of a cube; and who was carried off by convulsive motions: and add the woman also (*e*), in whom the cavity of the cranium was very narrow, in proportion to its length; who had been, probably, seiz'd more than once with an apoplexy; but at least had been kill'd thereby.

And if you should think proper to say, that other causes had been added to the male-conformation of the head; and these of an external kind; why then you would say the very same thing that I say of the cook in question.

17. And if to the schirrhous of this man's cerebellum; neglecting all the other disorders that were in the brain, as if none of their beginnings could have existed before the paralysis; contrary to what is shown by those very acute pains of the head which had preceded; if to this schirrhous alone, I say, you should choose to impute the paralysis; you will seem not to have remember'd, that not only the lower limb, which was subjected to the schirrhous, was resolv'd, but both of them equally so: which circumstance, beyond a doubt, is the reason why that, which I said had occasion to be confirm'd by other observations (*f*), certainly cannot be confirm'd by this.

And we should have been prevented from making the same conclusion, by other circumstances, in two observations, wherein I have describ'd one or other part of the cerebellum, either as most injur'd, or solely injur'd; by blood being extravasated within it, or by an eroding pus being collected about it: and these in the second (*g*) and the fourteenth letter (*h*). For in one of them it could not be observ'd whether there was any hemiplegia or not: and in the other there certainly was none.

18. But the history of the cook that is describ'd, say you, will at least confirm that which learned men now produce, in several places, against those functions which were attributed to the cerebellum by Willis.

For with so great a disorder of that viscus, the respiration and appetite for food were in their natural state in this cook: and the pulse itself was tense and vibrating; being in other respects in a moderate state.

As to me, however, though I do not allow of every thing that Willis has said of the cerebellum; yet I now-and-then fear, lest some persons should detract too much therefrom.

Wherefore, if I have given any hint in favour of this viscus, in my letters to you (*i*); particularly before the objections against it had so much increas'd; I would have you consider them in such a light, as to suppose that

(*b*) Ibid. eod. n. in fin. & Epist. 12. n. 2.

(*c*) Epist. 1. n. 15.

(*d*) Epist. 10. n. 9.

(*e*) Epist. 3. n. 6. 7.

(*f*) n. 14.

(*g*) n. 22.

(*h*) n. 3.

(*i*) Epist. 2. n. 24.

I judg'd it proper not to be entirely of a contrary opinion to others; but to go on cautiously and warily in the change of this doctrine also, as well as of others.

Nor was I influenc'd by any other motive; when it was my business to write upon wounds of the cerebellum (*k*); not to omit those things which you have read there; nor those things in like manner, which relate to injuries of the same viscus, that are not instantaneously brought on as wounds are, but happen in some shorter or longer space of time (*l*); such as schirrh in particular. Which things, as you may read them over again, I shall not repeat here.

But do not imagine that; when I found this very great disorder in the cerebellum, which I have so accurately and ingenuously describ'd to you; I was less surpriz'd than you have been in reading it, that the man's respiration and pulse were in that state, which, upon diligent enquiry, I found them to have been.

For certainly, I saw plainly that more was ascrib'd to this viscus, before these later times, than was proper; and that those excellent men were to be commended, who have admonish'd us, that we ought not to ascribe so much thereto.

And indeed it appears, that, as less importance is to be attributed to some other parts of the body, in another respect, than in former times; so less is to be attributed to the cerebellum than heretofore. Yet how far that importance is to be diminish'd, deserves consideration: and this I think our posterity will be better able to determine upon than we are at present. Farewel.

LETTER the SIXTY-THIRD

Relates to Blindness, to Aphonia, and Angina.

1. **A**LTHOUGH, besides those observations which I had publish'd before (*a*), I have sent to you more than one (*b*) of my observations upon blindness; but one, and no more, that related to aphonia (*c*); and one, in like manner, that related to angina (*d*); yet it has so happen'd, that out of those which I have made since that time, I can describe to you only one

(*k*) Epist. 52. n. 27.

(*l*) Ibid. n. 26.

(*a*) Epist. Anat. 18. n. 22. 38. 40.

(*b*) Epist. 13. n. 8. 9. 15.

(*c*) Epist. 14. n. 35.

(*d*) Epist. 44. n. 3.

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that relates to each of the two last-mention'd disorders ; whereas I have many that relate to blindness, with which I therefore shall begin.

2. The eye of a certain old woman was brought to me, amongst a great number of others, to be made use of in the public anatomical demonstrations of the year 1747 : which I the more willingly took upon me to dissect, because the figure of it, that was not so much spherical as it naturally is, shew'd it to have been blind ; and the greater part of the cornea was very opaque from large white spots.

The choroides adher'd more closely than usual to the tunica sclerotica ; especially in the posterior part. The anterior surface of the chrystalline humour was unequally hollow'd out in the middle ; and that to a considerable depth : the other parts of the same humour, although, when held up against the light, they resembled yellow amber, were found nevertheless, if consider'd in respect to that age.

When I attempted to remove the iris from the cornea ; I found that I could not remove the whole of it ; particularly in the middle. For, altho' it adher'd from one side quite to the middle, and even beyond the middle of the cornea ; yet it adher'd no where so closely as in the middle, where that surface of the cornea was unequal, and had a lamella beginning to abscede, as it were, and protuberating inwards in some measure ; whereas the external surface was smooth : nor could I observe any other preternatural appearance therein, except some very minute points as it were, and these rather obscure.

3. And this being the state of the parts ; and no cicatrices being seen any where on the external surface of the eye ; just as in another eye, which that celebrated anatomist Phil. Conr. Fabricius (*e*) dissected, and which had other circumstances that deserve to be read by you, but did not agree with this of mine, in the seat of the excavation of the chrystalline humour ; it was not very difficult for me to refer all the disorders that I have describ'd, to an internal cause, which had formerly preceded ; whether that had been an inflammation, or any other cause whatever.

On the contrary, I was much in doubt, whether ; in an eye which I likewise dissected in the college in the following year ; all the circumstances that I shall immediately enumerate, were to be imputed to a cause of this kind.

4. The eye of a man had its cornea opaque, for a long time together, as it seem'd ; and this part likewise retain'd slender indeed, but evident, traces of a cicatrix.

The chrystalline humour was connected with the coat just now mention'd ; yet was not hard, although it had decreas'd to such a degree, that scarcely a fourth part of it remain'd. The uvea was not in a very bad state ; but the vitreous humour and the retina were in a much worse state. The optic nerve, being become very slender, instead of the medullary substance, contain'd in the whole of that tract, which had lain within the orbit, a somewhat white and closely compacted substance. But of what nature it had been within

the orbit, I could not learn; as the brain had been inconsiderately buried some time before.

5. How much I was chagrin'd by this disappointment; and why I was chagrin'd thereby; you will easily gather, both from what I have written in the anatomical epistles (*f*), and in other places (*g*) also, to you. And I was the more pleas'd therefore, at least in the beginning, when an occasion presented itself to me; in the hospital; in the following year 1749, about the beginning of January; of pursuing that nerve, from a blind eye, within the cranium.

Which observation, as it is one of the two that I formerly referr'd to (*b*); and as I had sent the other to you afterwards (*i*), but have not sent this to you yet; shall now be accurately describ'd.

6. A man had formerly, when a boy, had his right eye so very much affected by the small-pox, as to see nothing therewith. But his parents, by licking it with the tongue, for a long time together, had been so far of advantage thereto, that it at length saw a little, yet very obscurely. Nor did this eye, from that time to the very day of the man's death; that is, to some time in his fortieth year; ever see more distinctly.

And, indeed, this eye was not only less than the other, but even the cornea itself; in which, in other respects, there appear'd to be no trace of injury, so that the whiteness which was behind it, might be clearly seen through it; was not equal to the other cornea.

Having therefore but slightly cut into the tunica sclerotica on the back-part; a quantity of limpid water immediately flow'd out: into which water a great part of the vitreous humour might seem to have degenerated; whereas the remaining part, which was in some measure similar to the humour in its natural state, had remain'd annex'd to the chrystalline humour, as it generally does: and this humour follow'd it when I drew it backwards.

This chrystalline was small in every dimension; and even somewhat less in thickness, than was suitable to an eye of that kind. On its anterior surface it was white in the middle, as I had seen it through the cornea; in other respects, it was of a whitish colour: and when I compress'd it slightly betwixt my fingers, it was soft.

But when I had begun to cut into the coat of this humour, water immediately burst out; having nothing purulent in it, but being even pure and limpid, and in such a quantity, in proportion to the smallness of the chrystalline, that this humour was immediately reduc'd to a much less thickness.

Whatever remain'd of its substance, retain'd its pristine lenticular figure: and when I had cut it through according to its diameter; both sections shew'd a series, as it were, of very small blackish particles, which was carried directly through the middle, from one extremity of the section to the other; whereas, in every other part, the colour appear'd of a dirty and obscure white. The other parts of the eye were not in so bad a state.

In the upper eye-lid, the sebaceous glands; which I had seen, in the

(*f*) XVIII. n. 40.
(*g*) Epist. 13. n. 7.

(*b*) Ibid. n. 10.
(*i*) Bpist. 52. n. 30.

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former man (*k*), to be even more beautiful and more thick than usual; I observ'd, in this man, to be less conspicuous than they generally are; perhaps by reason of the small pox: yet I plainly saw two, very near to each other, which had mutual decussations towards the upper part.

And this circumstance I was willing to take notice of here, in order to shew you, that some persons, who (without attending to this, I suppose, that when a figure of any appearances, which were not well represented before, is given, these things must be describ'd from a body, wherein they appear in the most elegant manner, whereas in mine there was not one representation as it were, but a manifold one) would complain of the want of those varieties which they solicitously enumerate, were nevertheless strangers to this of which I have just now spoken.

But now let us go on to that circumstance, for the sake of which, chiefly, I write this observation to you. The optic nerve that belong'd to the describ'd eye, contain'd a medullary substance indeed, under its thicken'd coats, where it lay within the orbit; but this substance was thinner than it naturally is: and if you compress'd it, you found it to be more moist than usual, as if it had a quantity of water mix'd with it.

But within the cranium, the same nerve was quite in a natural state; except that where it was join'd with its fellow, there it seem'd to be somewhat less thick than the latter: but above that place; for I trac'd it up as high as I could go; I did not even observe this difference, nor any other whatever; notwithstanding I enquir'd by every kind of means: nor could others, who had been exercis'd by me in anatomical pursuits, and examin'd it very attentively, distinguish the least difference.

7. In regard to water being found by me, at other times also, in the place of the whole vitreous humour; not to mention the posterior part of it; you may see what I have said on this subject, in my anatomical epistles (*l*): and in regard to the optic nerve which goes to a blind eye, you may see what I wrote in the places refer'd to above (*m*).

But as, when I was treating upon this subject (*n*), I promis'd you two observations, from whence you might, not without admiration, perceive, that there are sometimes disorders of this nerve; and even that very extenuation itself; and yet no blindness of the corresponding eye; and as I have hitherto only sent you one of those observations (*o*); you will now have the second.

8. In dissecting the carcase of an old man, who died in the hospital, in the beginning of the year 1752, of a cachexy, as was said; although this was not done with a view to investigate the causes of his disease; I nevertheless remark'd the following preternatural appearances.

The thorax had no extravasated water in it, as the belly had not likewise: but the lungs were not without hardness; particularly the left lobe, which, moreover, adher'd to the spine very closely.

The upper part of the cranium, which could not be pull'd away without force, was hollow'd out, on the inside, with a greater number of pits, or

(*k*) N. 4.
(*l*) XVIII. n. 38.
(*m*) N. 5.

(*n*) Epist. 13. n. 11.
(*o*) Epist. 56. n. 21.

cavities, than usual, in the os frontis, and in one of the ossa sincipitis; most of them being small indeed, but three of them very large and deep; two of which belong'd to the first-mention'd bone, and the other to that last spoken of: and that in this bone, as well as those in the other, was not only cover'd over with a thin lamella externally, but with one so very thin, that it appear'd to be perforated with small foramina.

And from hence you plainly perceive, how easily this cranium might have been broken through, and with how much danger even from the slightest blows, not to say from the trepan of the surgeon, if it had happen'd to have been applied thereto; as under this lamella was nothing more than a few bony fibres, dispos'd into the form of a reticular web, wherewith the dura mater, that invest'd these cavities, was intangled: and from hence arose that considerable difficulty in pulling away the cranium.

But I do not describe these appearances to you, because I should suppose them to have been the effect of a foregoing disease; whereof there did not here appear the least token; rather than the work of nature herself; forgetting those things which I have hinted in regard to these cavities, when writing to you on a former occasion (*p*); but because they were both very large, and no protuberance was prominent from the subjected meninges, made up of the corpuscles which were call'd glandulæ Pacchioni; not one of which was in this subject, although protuberances of this kind, as I then assert'd to you, are wont, at other times, to be receiv'd within these cavities.

However, although in the dissection of the cerebrum, I found the septum lucidum, and the fornix, most immoderately lax; and even, betwixt the two laminæ of that septum, found a little water; and in the lateral ventricles, a water similar to that wherein fresh meat has been wash'd; though not in great quantity indeed, nor join'd with a paleness of the plexus choroides; yet I found the substance of the cerebrum itself, and of the medulla oblongata, and nerves, arising therefrom, to be pretty firm, and quite in a natural state,

And I was, for this reason, the more struck with the state of the optic nerve on the right side; which, being perfectly sound, quite to its union with the left, and entirely similar thereto, appear'd, instantly after this conjunction, to be very evidently less thick than the left; and to be inclin'd to a cineritious colour: and in this manner it went on to the orbit.

Wherefore I immediately enquir'd, whether this man had been blind of his right eye: and as this question was positively answer'd in the negative, I examin'd that eye, and found it to be no less beautiful, and sound, than the left: nor did I see that the optic nerve of that eye differ'd any more from the left, within the orbit, than that it was certainly somewhat less thick.

9. But deferring those circumstances in the explication of which there may be some difficulty, to another occasion, let us now return to those things that are more easily accounted for: and after having added another observation, we will subjoin a certain conjecture.

10. The eyes of a miller; who was said to have been blind, and yet was wont to walk through the city, without any other guide than his stick; were brought to me to be dissected in the hospital, about the latter end of the year 1755. When look'd upon externally, through the cornea, they seem'd to be turbid rather than white.

I found both the chrySTALLINE humours to be somewhat opaque: yet not so as to be more opaque in some places, and less in others; but to be equally opaque every-where. Under the finger, and betwixt the fingers, both of them seem'd to be hard in an equal degree. Nevertheless one of them, which was the more slender, had its substance the more dry and more compact.

The other, which was the thicker, was more moist than it naturally is; so that it seem'd to discharge the whole of its moisture upon dissection: yet this moisture did not burst forth, but exude. One of them; for which it was my notes do not say; had a pupil of a pretty large diameter corresponding to it; and the other a pupil of a small diameter.

11. If you should wish for other examples of opacity, not so much of the chrySTALLINE humour, as of its coat; you may have them from the celebrated Haller (q). In reading of whose observations (r), and those of the celebrated Zinnius (s), which confirm the existence of the *membrana pupillaris*, found by the most excellent Wachendorffius (t); it seem'd that I might very easily conjecture, what that "kind of membranaceous integument, laid over the pupil, from the body of an infant, and having even the small arteries which creep through it fill'd with the most liquid wax," which was shewn to that eminent man Richard Mead (u), was; notwithstanding he made use of it to prove, that the cataract was sometimes, though very seldom indeed, found to be really membranous: that is to say, when "any little thin membrane has, by any misfortune, happen'd to contract a state of dryness."

I therefore think it very probable, that the pupillary membrane, being, in some foetusses, very thick, and adhering firmly to the iris, cannot be dissolv'd, and vanish before birth; but remains there, and causes the pupil to be shut up from the birth, and for that reason brings on blindness; just in the same manner as deafness is brought on by any very thick matter, which, adhering closely to the *membrana tympani*, does not fall out from the *meatus auditorius* of new-born infants; as it generally happens in others, in the manner I have mention'd, in more than one place, in the Anatomical Epistles (x).

There are other disorders also; and those even internally seated; which may be set in a much clearer point of light, by comparing the organs of hearing and of vision with each other: but those things that happen to the eye, may happen so much the more easily, in proportion as the structure of it is more subtle.

And if this circumstance appear'd from nothing else, it might be very easily conjectur'd, merely from the different method, in which the all-wise

(q) Opusc. Pathol. Obs. 3.

(r) Opusc. Anat. XIII.

(s) Deser. Anat. Oculi hum. c. 2. S. 3. § 4.

(t) Commenc. Litter. A. 1740. Hebd. 18. 1.

(u) Monit. Medic. c. 11. S. 2.

(x) V. n. 2. & 6. & XIII. n. 3.

Fabricator of our frame, has carried the nervous fibres that administer to the senses of smelling, hearing, and seeing; that is, the olfactory, the auditory, and the visory nerves; each into their proper organ.

For he has sent them into the nostrils, through the evident foramina of the os ethmoides, and they are consequently pretty thick; they pass into the ears by much smaller apertures, and are for that reason much more slender; and, at length, the foramina by which they pass into the eyes, are, as the most modern anatomists have shewn, extremely small, and these fibres of course extremely slender; so that the great Author of our existence seems to me to have pointed out, by a kind of gradation as it were, the subtle, the more subtle, and the very subtle, fabric of each of these instruments of the senses. But these things I shall perhaps speak of more at large on another occasion.

Now let us pass on to the diseases of those parts, which were form'd for the purposes of speaking, and swallowing; as we have promis'd; and particularly to those of the nerves that go to these parts.

12. Of a fatal aphonia after drunkenness, I have written to you on a former occasion (*y*); when I likewise sent an observation of mine join'd with a dissection. I shall here add another.

13. A servant-man; who was about sixty years of age, of a tall stature, and a good habit of body, but much given to drinking; having been often receiv'd into the hospital before; once on account of a violent venereal gonorrhœa, in the course of which so great a quantity of virulent humour had been discharg'd, that he complain'd of a weakness in his loins; but having been brought there, more than once, by reason of being speechless after drunkenness, and yet having gone away in good health the following day, this aphonia being discuss'd together with his drunkenness; was at length brought thither again from the same cause.

At this time, however, he had lain in the road in the night, and was taken for a dying man; and indeed his pulse was very low: and although, after being brought into the hospital, he vomited up a great quantity of wine; yet he never more utter'd a single word.

And indeed, being seiz'd, on the following day in the morning, with a violent fever, and being, besides that, depriv'd of the faculty of feeling, and moving in the left upper limb only; for the other parts appear'd to have feeling when stimulated; he had some blood taken away, and seem'd to reap some little advantage therefrom: but even eroding plasters, of the kind that are call'd vesicatories, being, at length, applied to the legs, and being not of the least effect, he continu'd speechless in the same manner he had been brought into the house, to the very hour of his death; which happen'd, without the least convulsion at any time being observ'd, on the beginning of the fourth day: and this was the fourteenth of March, in the year 1756.

I could not examine the body before the seventh day after death, on account of being detain'd at home, by a sudden and unforeseen knee-gout;

and, as I fear'd lest I might be detain'd there for a much longer time, I order'd that the head at least, and the penis, together with part of the annex'd bladder, should be preserv'd.

While the head was divided from the body; which was done in the space of two days after death; a great quantity of black and dense blood had flow'd out. And for this reason I was the less surpriz'd, that upon, at length, opening the cranium, the vessels of the pia mater were seen, by me, not to be distended with blood.

In the right lateral ventricle I found a great quantity of water: the plexus choroides was of a pale colour; and where it bends itself in an anterior direction, was increas'd in its bulk, by the addition of small but very thick-fown hydatids.

In the left ventricle was much less water, and fewer hydatids. Yet from this difference betwixt the two ventricles, that paralysis, on the right side, had not proceeded. For although, besides the cerebellum, and the medulla oblongata, the left hemisphere of the cerebrum was in a proper state also; I nevertheless found a somewhat round and small cavern in the right hemisphere, capable of containing a small walnut, and full of black blood.

This cavern was not only contiguous to the external side of the corpus striatum, and the thalamus nervi optici, but also occupied some part of both these bodies; yet so as not to open within the ventricle. And, after examining these parts, I turn'd my researches to that lower part of the bladder, and the annex'd urethra.

The coats of the bladder were pretty much thicken'd, in consequence of the patient's having labour'd under a difficulty of urine, at the time of being affected with the gonorrhœa. And, on that internal surface of the bladder, such a number of sanguiferous vessels tended towards the orifice, and were so distended with blood; that you would, at first sight, have suppos'd as many hæmorrhoids to be prominent there, and covering that place, as there really were congeries, or groupes as it were, of parallel vessels.

Having open'd the urethra, from that orifice quite to the termination thereof; I found no ulcer in any part; nor even any colour but what was natural. And indeed, although I press'd out a kind of putrid matter from the orifices of the prostate gland, that was of a white colour, inclin'd to cineritious; I imputed this appearance to the delay of so many days: but the other appearances, which I shall now mention, I ascrib'd to the gonorrhœa that had formerly preceded.

In the caruncula seminalis, the orifice of my sinus was considerably lax; and the sinus itself was longer than it generally is. And from both sides of the caruncle were some parallel lines, that pass'd in a longitudinal direction. But these were very low. Yet not so a ring that was prominent from the internal substance of the urethra, like a fasciculus of muscular fibres; so that it might seem to have been capable of being an obstacle sometimes to the descent of the urine, or to any other fluid.

This ring pass'd over almost the lower part of the beak of the caruncle; being affix'd to this, as well as to the remaining surface, and in no part free and unconnected.

Although, about Littre's gland, and that part wherein the orifices of Cowper's glands open, I could distinguish nothing that was preternatural; I again observ'd, in that part which is about three or four inches above the termination of the urethra, some white fibres, as it were, which protuberated obliquely; but only in a slight degree. These fibres were on the sides.

And as to what orifices of my canaliculi were in this tract, it was sufficient to look at them in order to see that they had formerly been affected by disorder; so much more were they contracted than the orifices of the others, and so different was the neighbouring surface, on both sides, from all the remaining surface.

Having describ'd such appearances as related to violent disorders, I imagine you will not be displeas'd with me, if I add a few things that were observ'd in the head of this man; one of which relates to disease indeed, but to a slight one only; and three others, though not to disease, yet to appearances quite unusual, and, in great measure, preternatural.

The first was an encysted tumour, not larger than a small grape, which protuberated in the right temple, not very far from the forehead. It was full of a white matter like milk; but somewhat less fluid than milk. The cavity of the coat containing that matter, which was of a spherical figure, belong'd, in one half of it, to the skin; the other half was below the skin.

In the second place, there were no pituitary sinusses of the forehead.

In the third place, there were sphenoidal sinusses of the same kind indeed, which however were not divided into the right and left, but into the superior and inferior; the latter of which was the largest.

Finally, in the fourth place, the styloid process, on the left side, was almost four inches long: so that it is scarcely distant by the breadth of a little finger (for I still preserve it by me) from the os hyoides; this interval being fill'd up by that round ligament, whereby it is connected with this bone; unless you should rather choose to suppose, that all the upper part of the same ligament was become much thicker than usual, and converted into bone: for it happen'd to the right ligament also, in almost the middle of its length, that for the extent of an inch and a half, it became very thick and bony; and that very evidently, as there is nothing either above or below but ligament.

14. But whether we are at liberty to deny the existence of this ligament; as Weitbrecht (2) has made no scruple of doing; it is not the proper place to dispute here.

I will only say, by way of objection to him: it were to be wish'd, that, before he denied this existence, he had lit (if not upon the appearances which I just now describ'd) at least upon a series of little bones, such as Vesalius (a) and Eustachius (b) have represented in their figures as having been seen by them; and as I have in great measure seen: which little bones are so form'd and connected, and go on so directly from the styloid process to the os hyoides, that you may perceive them to have been parts of that liga-

(2) Syndesmolog. S. 6. §. 15. & seqq.

(a) De corp. hum. fabr. l. 2. c. 13.

(b) Tab. 47. Fig. 14.

ment; which at first became cartilaginous, and then, as the appendices of the very same bone are wont to do, were themselves chang'd into bone likewise; still preserving the place and function of the ligament whereof we speak.

But Weitbrecht seems never to have lit on any thing more than "one or two bony granules, form'd" upon the os hyoides (*c*).

We will consider therefore, on another occasion, how far we ought to indulge his opinion, where we shall examine other things likewise that relate to the same bones; as, for instance, that which has fallen even from some of my predecessors, that the ligament, of which we are speaking, is inserted into the appendages added to the extremities of the apices of the horns; and, in like manner, whether these other appendages, or at least those which are frequently form'd upon the very short ligament, which connects those extremities with the upper processes of the cartilage thyroïdes, have been so neglected by anatomists, as some learned men seem to believe, who forget our Fabricius ab Aquapendente (*d*), Bauhin (*e*), and others; and these even the more modern authors, as Verheyen (*f*), Winslow (*g*), and Weitbrecht (*h*), some of whom have formerly represented them in figures even doubled: others have describ'd them: some have propos'd some use: but almost all of them have made mention thereof sufficiently. But of these things, as I have already said, on another occasion.

It is more to the purpose at present, to consider a little while what circumstances you have read in the history propos'd, that relate, beyond a doubt, to disorders, and those not slight disorders neither. For they relate to subjects which we have treated of at large in other letters, as that last appearance; to begin from thence; which I saw in the urethra.

I would, therefore, wish you to compare it with those appearances, which we have, at other times, seen left after a virulent gonorrhœa (*i*). You will read that protuberating lines occur'd to me then also in the urethra; and that I found the orifices of the canaliculi, not only contracted, but obliterated: from whence we might conjecture foregoing exulcerations and obstructions opposing themselves to the urine and the catheter, and might clearly perceive what had been frequently, and unjustly, consider'd as cancrules.

But in regard to the little cavern, fill'd with blood, found in that hemisphere of the brain which was opposite to the paralytic limb; and in the neighbourhood of the corpus striatum and thalamus nervi optici; there is no occasion to point out the observations of ours, wherewith you may compare it; as I have already done this in the last letter (*k*) I sent you.

And in regard to the fatal aphonia after drunkenness (as I have told you above (*l*), where I have related a case of the kind), if you compare that history with this; you will observe that both the men died almost within

(*c*) S. cit. §. 17.

(*d*) De Larynge Fig. 9.

(*e*) Theatr. Anat. l. 3. c. 44. & Tab. 33.

Fig. 1.

(*f*) Anat. corp. hum. tr. 3. c. 11.

(*g*) Expos. Anat. tr. de la Teste n. 433.

(*h*) S. cit. §. 20.

(*i*) Vid. Epist. 42. n. 41. & Epist. 44. n. 9. & Epist. 60. n. 12.

(*k*) Epist. 62. n. 13. (*l*) n. 12.

the same time, and both without convulsions, and the last even though he had been soon seiz'd with a fever: so that if you should be willing to examine, and prove these events by those dogmata of Hippocrates which I then produc'd; you may understand, even from hence, how few dictates of physicians are extant, which you may receive without any exception.

And you will even plainly perceive, from what I have written to you on former occasions, that those things which are said of a fever solving an apoplexy, whereto it succeeds, cannot be true without many exceptions.

Yet I confess we are not here at liberty to make use of that exception, which is made mention of in the latter part of the eleventh letter (*m*); for the fever soon came on.

And in regard to another, which I have referr'd to in the second letter (*n*), you will perhaps be doubtful here at first; as you will see, that in both of the aphonous patients, there was water in the brain: although in this last who was seiz'd by a fever, we are scarcely at liberty to suppose the apoplexy to have been of a ferous kind: but, by reason of the little cavern, hollow'd out by blood, we are rather under a necessity of supposing it to have been of a sanguineous nature.

15. But as, when I treated of aphonia before, I spoke not only of that which is fatal, and from drunkenness, but also of another far unlike this, relating a certain cure of mine; I now also think it will not be improper to give the history of two other cases, of virgins who were speechless; which I shall do in a very few words.

I was consulted for both of them, and gave an answer in writing. And indeed both of the young women were cur'd, the one perhaps by me, the other certainly rather by accident. For being carried into the country at the time of the vintage, it there happen'd, while she was tasting a grape, that some part of it falling down into the larynx, excited a violent cough, after which she could immediately speak; but not for a very long time; nor was this to be wonder'd at, in one who, during so long a course of the disorder, had sometimes been free therefrom; but had fallen back into the same incapacity of speaking afterwards.

And the same thing had likewise happen'd to that other virgin, before her noble parents ask'd my advice for her. But I was inform'd that she, after the use of remedies, had recover'd her voice again; and have never yet heard that she lost it any more.

But for what length of time the cough cur'd this disorder; by what means it cur'd it; whether by discussing any matter, which, however, did not fall under the notice of the senses; or by exciting the inert muscles of the larynx; or by bringing about any other change of this kind in the nerves; it would perhaps be very useful to physicians to know: and this that, in a similar case, they may, with the more confidence, try what advantage could be obtain'd by the assistance of a cough; although this should be excited in a moderate degree only.

16. But now let us go on to another disorder of the larynx, or pharynx, or both of them; I mean the angina. When, in writing to you, I made

mention of this disorder (*o*), I complain'd, and was at the same time surpriz'd, that no dissections of persons who died of this disease were extant.

For it did not seem that this could have happen'd, in a disease that is not only so dangerous, but also not uncommon; and a disease that even sometimes spreads abroad epidemically, in the manner it did formerly; as Macrobius (*p*) has related from Julius Modestus; when sacrifices were instituted to the goddess Angerona, "because the Roman people was freed from a disorder which is call'd *angina*, by the previous blowing of a south wind."

And in times nearer to our own, it has produc'd great and long-continu'd slaughter, by falling upon children for the most part. Yet although the laudable custom of dissecting human bodies was then much practis'd, and physicians no little vers'd in anatomy were present; as among the Sicilians Jo. Bapt. Cortesius, and amongst the Neapolitans M. Aurelius Severinus, who not only visited the patients, but wrote of this their disease (*q*); you will not find any dissection relative thereto in their writings.

And indeed Cortesius was one of those who persuaded the senators of Messina, when they insisted upon having enquiries made into the disorder by dissection; or, at least, one of those who thought the persuasion to be just; "that the dissection of carcases was, altogether, of no use, in regard to the knowledge of that disease;" as he judg'd it to consist in the inflammation and gangrene of parts, which could very well be seen upon opening the mouth; and particularly of the tonsils.

Severinus also, supposing it to be sufficiently known by the symptoms, was not willing "to take upon him the tedious labour of delineating the seat of the disorder, or the disorder itself;" not even in words (*r*). He therefore, at last, sent only one single observation to the printer at Francfort, which could not be inserted in the book that was already copied out in proper form for the press; for which reason it was publish'd in the latter part of the volume, among other things which were also to be added to the foregoing books.

This observation you have, indeed, in the Sepulchretum (*s*), where I also had read it; but so negligently copied, that amongst other words which have a tendency, in general, to confirm the hypothesis of Severinus, these very few things, which alone related to the title *De Angina*, are omitted: "The larynx, being strictly examin'd, was found to be cover'd with a kind of pituitous crust on the external surface, without the appearance of an ulcer."

And this was the only observation which I could find, from the time of having written to you, of the larynx of a person who died of an angina, being examin'd by dissection; though I made no doubt, but if Severinus had chosen to make these enquiries, not once only, but frequently, as he

(*o*) Epist. 14. n. 39.

(*p*) Saturnal. l. 1. c. 10.

(*q*) Miscel. Med. Dec. 9. Epist. 6. De Re-

cond. Abscess. Nat. l. 8. five Diatriba de Pedanch.

(*r*) Part. 1 in fin.

(*s*) L. 1. S. 23. Obf. 4.

certainly had sufficient opportunity of doing, since that angina had, from his own testimony (*t*), kill'd "many thousands of children;" I made no doubt, I say, but other appearances would likewise have occur'd in other bodies.

Wherefore, as I could not find any other observations upon the angina that were said to be made upon human bodies, besides this one of Severinus; I enquir'd whether any were extant from beasts at least: and yet I could only find that these appearances had been seen, in dogs which died of an angina, by Stegmannus (*u*); that is to say, "The necks were externally tumified: the internal surface of the fauces, and the muscles of the throat, were inflam'd."

But if the seat of this disease, as well as that of others, were enquir'd into more frequently, and describ'd; do you think there would have been any-one in our age, who should assert, without producing any enquiry of this kind, that the thyroid gland "is the very sole and only part, which constitutes the seat of the angina, when in its most violent degree."

17. But since the time I made that observation, which I afterwards sent to you (***), upon the fauces, larynx, and aspera arteria of a young man who had been carried off by an angina; I know that others have come forth, which were made in the same year, especially upon children, who, as we have said was the case formerly in the kingdom of Naples, and Sicily, were then carried off in France by the most violent angina.

The physicians there were not satisfied, either with the signs of the disease, or with the inspection of those parts only, which come in view, when the mouths of the patients are open'd: nor was this without effect; for upon dissecting the bodies of children, they evidently found how great a disorder might lie hid in the aspera arteria, as you will learn from two dissections, the accounts of which were sent to the Royal Academy of Sciences, by that ingenious physician of Orleans, Arnault, and publish'd by this Academy (*x*).

But even some of our countrymen, of approv'd diligence and veracity, have not been wanting to themselves in this respect; as I have learn'd from a history, which, being written by one of them, has come into my hands. The summary of it was, that, in a man who had been kill'd by an angina, the larynx was found to be inflam'd; and that the upper part of the pharynx, together with the palatum mobile, and tonsils, was found to be corrupted, and quite black with a gangrene and sphacelus.

18. You perceive that I here speak of the true, that is the inflammatory, angina; just as I did in the fourteenth letter (*y*). But in regard to the spuriow, which I now see is call'd the watery angina by eminent physicians; by whom the other species of angina, and amongst these the convulsive, are taken notice of; if you wish to know what I have seen by means of dissection relative thereto; take what follows. That in regard to the spurious angina I dissected one or two, whom I have describ'd to you in the same

(*t*) De efficac. Med. 1. 1. p. 2. ubi de Phlebot. c. 16.

(*u*) Eph. N. C. Dec. 3. A. 5, & 6. Obs. 169.

(***) Epist. 44. n. 3.

(*x*) Memoir. A. 1742.

(*y*) N. 39.

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letter (z), and who died with this disorder, if you please, but certainly not of it. And to the convulsive species I cannot refer that which rather approach'd to the nature of the *Paralytodea*, as some call it, in that woman whose history I shall immediately subjoin.

19. An old woman; who had lain a long time in the hospital, and was become so emaciated as to seem to be nothing but skin and bone; having a fever at length come on; or, at least, made more evident; and she not being able to swallow, nor yet to open her mouth, so as to give room to examine the internal parts sufficiently, was suppos'd to die of an angina, about the end of the year 1755.

Upon dissecting the head in the hospital, we found the internal maxillary glands to be large, and especially the right; so that it might, perhaps, have prevented the depression of the jaw, so much as was necessary to the opening of the mouth to any considerable degree: and in some measure might even have been injurious to deglutition: yet not so as entirely to prevent it. But the larynx was sound: and the aspera arteria, and the fauces, together with the palatum mobile, were found to be in a sound state; as the tonsils and root of the tongue were also: nor did that enlargement of the maxillary glands seem to be recent.

The thorax had a small part of one of the lobes of the lungs in a state of hardness; and not without some purulency. Then the spine, also, was observ'd to be somewhat deviating from its natural course; though but slightly. Yet this inclination had, probably, been the cause of the woman's carrying her head in such a manner, that, of the two round ligaments whereby the dentoid process of the second vertebra is connected to the edge of the great foramen of the skull, I found the right to be longer and thicker than the left.

20. And Mead (a), indeed, had not found "even the very least mark of inflammation, in the glands, or the muscles," of the fauces; when he dissected them, in the body of a man who had been carried off by a convulsive angina: but all the vessels were turgid with very thick blood, and every-where prominent. Nay, and he goes so far, as to make mention of a convulsion of all the nerves in this angina; and calls the disorder, in express words, "a strangulation of the fauces."

But as there was no sensation of this kind, nor the other appearances that were just now spoken of, in the old woman in question; and as there were some other of those signs, which Boerhaave (b) takes notice of, in an angina "that has the nerves and muscles paralytic;" as, for instance, not only that "it appears without any mark of external or internal tumour," but also "in the end of long diseases," when the body is "very greatly" exhausted of its juices: "and that it is then almost always the sign of death" "being at hand, and after death shews the lungs to have been suppurated;" I should therefore believe that this angina is not to be refer'd to a convulsive, but rather to a paralytic affection, if we must refer it to one or the other species of disease.

(z) N. 24. & seqq.

(a) Monit. Med. c. 4.

(b) Aphor. de cogn. & curan. morb. § 784. & seqq.

21. Thus far I had written, when turning over the volume of the *Acta Eruditorum* (c), lately imported here from Leipzig, I learn'd some things from books that we have not in this country, relative to one, and to another species of disease, which we have treated of in this letter; I mean, the angina, and blindness.

To the former relates the historical dissertation (d), written in French, upon the gangrenous angina of children; the same, I suppose, that we have been speaking of above (e); and to blindness the observation of that celebrated man Philip Adolphus Boehmerus (f), upon a woman, who, having been seiz'd with an obscurity of vision, after obstinate disorders of the head, and at length with a loss of sight, had, in her body after death, besides other appearances; and particularly a quantity of serum, in part foetid, wherewith the three first ventricles of the brain (for the pituitary gland was schirrhous and ulcerated) were distended; had, I say, besides these appearances, a fungous excrescence lying upon the conjunction of the optic nerves.

And you will, at the same time, find other observations in this book, that relate to different disorders; so that I do not doubt, but it will be very agreeable to you, that I have referr'd you thereto. Farewel.

LETTER the SIXTY-FOURTH

Relates to Disorders of the Thorax.

1. **I**N proportion as the interval of time betwixt sending you my first letter, on the disorders of the head, and the present year is greater; and in proportion as there are more parts in the head than in the thorax; so many the fewer observations had I the opportunity of making upon the disorders of this last-mention'd cavity: so that I can easily comprize them all in this one letter; wherein I shall, in the first place, declare what appearances I have seen in the lungs, and after that in the heart, and its large vessels.

2. A woman, of a middle age, had died in the hospital of an inflammation of the lungs, about the end of January, in the year 1755; at which time I was teaching anatomy in the college. And that I might go on to do this the more fully; there were carried thither from her body also (for I had the same supplies from several other bodies), together with those parts with

(c) A. 1758.

(d) Vid. M. Jul.

(e) n. 18.

(f) Vid. M. Januar.

which women are furnish'd for the sake of generation, and the secretion of urine; the viscera of the thorax itself, such as they were, together with the diaphragm.

In examining those parts of the belly, I found some things which only deviated from the general rule of nature: and others which were entirely preternatural.

In the number of the first was a roundish body, of the diameter of a full inch; of a reddish colour, and surrounded with its coat; which, although it was in the adipose membrane of the left kidney, yet was certainly neither the *ren succenturiatus*, which was double on that side, nor another very small kidney, nor a lymphatic gland; but rather another very small spleen, as the nature of it, when cut into, demonstrated.

For in the circumference, as I have often observ'd in the spleen, it was of a bright red colour; and, in other respects, of a red colour degenerating into brown: so that, although the structure gave somewhat more resistance to the knife than the spleen gives, every one, who saw it, readily allow'd it to be a spleen.

The same left kidney was longer than the right: nor was this to be wonder'd at; as it was furnish'd with a double pelvis, one at the upper part, and another at the lower part; being quite distinct from each other, as the ureters were also: for these canals coming out, one from each pelvis, open'd at the usual part of the bladder, by an orifice (an appearance which it had never happen'd to that very experienc'd anatomist Eustachius (*a*) to see; but which I have happen'd to see three times at least (*b*)); by an orifice, I say, proper to each; the one being at a little distance below the other.

But whether that which I observ'd in the uterus related to disease, or only to the time of the menstrua being at hand, was a matter of doubt. For the upper part of the fundus was internally red; but, although the sanguiferous vessels were seen through the internal membrane; by pressing the fingers underneath, no blood was discharg'd nevertheless, as is frequently the case at other times.

Yet, certainly, those appearances which I saw in the trunk of the great artery, and its iliac branches, were to be referr'd to disease. That is to say, in the former were white spots internally, the beginnings of future ossifications; and in those branches, and on their internal surface likewise, parallel lines drawn in a longitudinal direction were prominent: and these lines could not be obliterated by any means; not even by drawing both sides in opposite directions.

The thorax also exhibited diseas'd appearances; and still more than the fore-mention'd parts: yet there were some which are rather unusual than preternatural. For the diaphragm transmitted the venous blood, that came up from the belly, not through one foramen, but through two foramina (which I also found very lately in the year 1759, and publicly demonstrated, in the body of a man); I say, through two foramina very near to each other; in the same manner, for instance, that I formerly told you of by three.

(*a*) De Renib. c. 19.

(*b*) Vid. Epist. 7. n. 17. & Epist. 54. n. 33.

Yet in the heart, the orifice of the coronary vein was not furnish'd with a membranous valve; but so cover'd with slender and frequent parallel filaments, going down from the upper part to the lower; as well on the right side, as on the left; in such a manner, that the blood could nevertheless pass through betwixt filament and filament; and still more through the middle of the orifice, where the filaments were entirely wanting.

But as to the morbid state of the blood, hereto related the white polypous concretions, which were drawn out from the large vessels of the heart; and to the morbid constitution of the solid parts, related not only those tubercles, whereby the border of the valvulæ mitrales was become thicken'd; as I have seen at other times, and that not unfrequently; but particularly that which brought on the cause of death; I mean, a great part of one lobe of the lungs being swollen, hard, heavy, and dense internally, and of a firm substance; which was not only of a colour dilutely red, like that of liver after being boil'd; such as I have very frequently seen in inflammations of the lungs; but also of a colour somewhat white, from purulent matter being mix'd with it, as it was natural to conjecture: and this purulency was concremented by the frost, which was very powerful and severe in that season.

On the back part of the aspera arteria, the cellular membrane was so distended by the fluid detain'd therein, that the glands, which I formerly delineated there (*c*), scarcely or not at all appear'd.

3. I have not made this one dissection only, that related to disorders of the thorax, since the time I sent such a great number in the twenty-first letter. For you have receiv'd the descriptions of others after that in other letters (*d*); particularly the last; which you will join with those, propos'd in that letter and in the twentieth, wherein the pleura was not free from inflammation; although the patients had been free from a sense of pungent pain.

And, although I have not omitted to conjecture, by what means it had happen'd thus, when I gave you these observations; yet as very experienc'd men now teach us that the pleura is devoid of sensation, by the original institution of nature; which certainly no one could have prov'd at that time; I shall not be displeas'd, if, when that controversy shall be at length accommodated to their opinion, you prefer their dogma to my conjectures; and, by this means, much more easily explain, not only those, but other observations similar thereto; among which is the observation made by that celebrated man Ignatius Vari (*e*), and that which the same author has referr'd to, as formerly made by Petrus Crispus.

Certainly each of them, in whatever manner you may choose to explain them, is well worthy to be transferr'd into the Sepulchretum.

However, in regard to what relates to pains of the chest and sides, there are others; and these of more than one kind; which deserve your consideration; and in particular that, which, from an acute pain near the left side of the sternum, join'd with the signs of a peripneumony, seem'd to relate to an inflammation of the anterior part of the left lobe of the lungs; whereas, after the death of the patient, which was then unexpected, the celebrated

(*c*) Adv. I. Tab. 2. Fig. 1.

(*d*) Epist. 36. n. 23. & Epist. 75. n. 16.

(*e*) apud P. Tosetti full' Insensib. &c. Lett. 4. n. 24.

Lieutaud (*f*) found, that it had, in fact, related to an inflammation and suppuration of the membrane that invests the pericardium internally, and the heart externally.

Yet this observation, which well deserves your reading, on account of the very remarkable seat of the disorder; and which you ought to compare with others of the same kind, that I shall tell you where to find below (*g*); belong'd to the class of inflammations nevertheless.

But there are others which belong to quite another class of diseases; as, for instance, that which you will read from the relation of John Larber, formerly my auditor, but now a learned and very experienc'd physician. For this author; in the annotations which he has interspers'd in his edition of Palsin (*b*); relates of a young man; whom he saw labouring under a cough of long standing, a spitting of blood, and a recurrent pain of the right side; that he was freed from these complaints by having cough'd up a piece of stony matter, similar to white coral.

And, in the same place, he takes notice of the lungs of a man; who had labour'd, for a long time, under the *morbis niger* of Hippocrates, and had died in the last stage of a marasmus; being flaccid: and in many parts of them he found hard little bodies, of the bigness of peas, and of a globular form.

Which things, as he has added them to that observation of his author, wherein he relates that a stone was found by him, in the lungs of a soldier; not less than a pigeon's egg, and not unlike an egg in figure; I here take notice of also, that you may add these three observations to the former; and may compare them with some of those which I have collected for you in great number in the fifteenth letter (*i*), when I discours'd upon calculi of the lungs, and their effects.

4. But to those things that I have produc'd in the nineteenth letter (*k*); which were not a few, and of various kinds; in regard to the long-agitated controversy, whether water be in the lungs and stomach of drown'd persons, or not, some dissections which I read not long ago relate. For that very accurate anatomist Meckel; in describing the fifth (*l*) of his observations upon the disorders of the heart, made upon a soldier, who had thrown himself into the river; says, that the lungs were entirely full of air and blood: that is to say, full of the latter within the vessels; which he found to be very tumid, with fluid blood, in the other viscera also, as in other drown'd persons: but if he had seen the stomach to be swollen with water, it does not seem that he would have omitted to mention the circumstance.

Another dissection is that of an epileptic patient, who, having thrown himself into the cold bath, was soon after found suffocated therein. But in none of this man's viscera, was any water found by the celebrated Welspremus (*m*); who, when the aspera arteria was perforated, heard "the air,

(*f*) Mem. de l'Acad. R. des Sc. A. 1752.
I. Mem.

(*g*) N. 14.

(*b*) Anat. Chirurg. Tom. 3. P. 6. c. 9.

(*i*) N. 19. & seqq.

(*k*) N. 40. & seqq.

(*l*) Sect. 1. Vid. Hist. de l'Acad. R. des Sc. de Berlin, A. 1755.

(*m*) Obs. Med. 8. § 2.

“ which was then contain’d in the lungs, rush out with a kind of whistling “ noise:” for which reason he thinks that it is not water, but air, which, being before “ accumulated by repeated inspiration, and distending the vesiculæ pulmonales,” prevents the transit of the blood through the lungs; and consequently the circulation thereof through the whole body; and by this means kills those who are immers’d in water, “ and perhaps strangled persons.”

And as to what relates to strangled bodies, you may remember, what I suspected in that very same letter (*n*), of the air being retain’d in their lungs, and dilating itself.

However, in regard to drown’d persons; being mindful of those things that others, and I myself, have seen by experience; I am the more in doubt, in proportion as I read the more attentively, another observation (*o*) which the same celebrated man has immediately subjoin’d to the former.

For when he endeavour’d to recal to life a certain sailor, who had been drown’d in the river Thames, and was not found, and taken out, till “ after “ a quarter of an hour and half a quarter;” and had then no signs of life remaining in him; he did not immediately perforate the aspera arteria, but, at length, perforated it after consuming “ a whole hour ” in the use of other remedies: nor did he observe any sign of air bursting forth, as he says; and even, introducing a pipe through that foramen, forc’d in the air “ at repeated “ times, so that, the vesicles of the lungs being inflated,” and other remedies being made use of, (all which you will read were not without effect) he might push on the circulation of the stagnating blood; which he at length happily brought about.

Nor indeed within the time of that cure, which exceeded two hours; that is to say, till “ the dead sailor,” as he at first seem’d to be, “ was recall’d to “ life;” is any-thing said to have been thrown out of his mouth: so that we cannot reconcile this with our observations, and those of others; and in particular those of the very ingenious Haller, whose dissections; though not so much that which was made on a woman, who had been immers’d many hours, as on a cat, and dogs, which were immers’d for a very short time; it will be sufficient to have referr’d to here in a word, not only because you may see them taken notice of in that letter of mine (*p*), but because you may see them propos’d afresh by him very lately (*q*); and, at the same time, learn, that he hitherto expressly asserts (*r*); of the viscid spume, which arises from water agitated with air, in the lungs of drown’d persons, and is found therein; that it can “ be forc’d out, and ejected from thence, by no art yet known to “ us;” and that, as long as it stagnates there, it prevents the necessary passage of the blood, from the right ventricle of the heart to the left.

And this he the more convictedly asserts, after having tried that even the most violent shock of electricity is not sufficient for this purpose.

Yet he himself also confesses, that there is the highest difficulty in conciliating his observations with the number of opposite ones, wherein art has

(*n*) N. 38.

(*o*) Sub n. 9.

(*p*) N. 45.

(*q*) Mem. sur plusieurs phenom. de la respiration. S. 4.

(*r*) Ut antea opusc. pathol. Obs. 62.

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excited the persons to life ; so as to make the mind of the conciliator, not to mention others, acquiesce therein : and some observations of this kind he, contrary to what you would have expected, produces, in his Elements of the Physiology of the Human Body (*s*), which he has lately publish'd, among the arguments for a matter which he there treats upon.

But as, among the experiments which relate to that controversy, he has added some things which relate to another ; that is to say, whether it be rightly argued from the lungs of a foetus swimming in water, that it was born alive, or not ; I would have you attend to these things also, and those that he deduces therefrom.

For you will find something to add to what I have written to you, upon the cautious use of that medico-legal experiment, in the same nineteenth letter (*t*) ; either when I consider'd a foetus, whose carcase has been attack'd by putrefaction ; or when I had one in my eye who has drawn in the air as it is coming out from the belly of its mother, and died in the very birth ; or, finally, whether one into whose mouth the air has been impell'd : for you will observe, that out of so many inflated lungs of foetusses, the air could not be press'd out from any, except in one lamb only, to such a degree, as to prevent the lungs from swimming any more in water.

The remainder of this question, and any thing else that relates to the lungs, we at present omit. For now we must pass on to other things, whereof much is to be written ; that is, to the disorders of the heart and its large vessels ; beginning with the pulse, and with that very rare pulse, in regard to which ; as I have already said, when I hinted at its having been observ'd by me in an old man (*u*), it might happen that I should sometime or other give the full history of it to you ; I now send you the whole relation, as I gave you reason to expect.

5. This man was a merchant, at Padua, of sixty-four years of age, of a square stature, and of a fat habit of body ; but not to excess. He, having been formerly subject to a rheumatism, and contractions of the nerves, had been cur'd by medical remedies : so that notwithstanding he was taken up with many and various businesses continually, he was, nevertheless, in good health, to that very age which I just now spoke of ; when, of a sudden, some circumstances happen'd, from whence he was seiz'd with very violent affections of the mind, with terror, fear, anger, and sadness.

A few days after these commotions, a kind of vertigo coming on, he fell down. And, on the day following, he began to be troubled with convulsive motions, together with an attack similar to an epilepsy.

This attack was short, but frequent, and was solv'd by the breaking forth of foetid eructations ; a redness of the face sometimes coming on, and sometimes a paleness : but it was violent, by reason of the sense of narrowness and constriction of the fauces, which attended it continually ; and by reason of the same constriction of the stomach also.

The pulse was, at that time, strong indeed, but hard and rare : and the intestines and bladder excreted only a very small quantity.

(*s*) Tom. 1. l. 4. S. 5. §. 11.

(*t*) n. 45. & seqq.

(*u*) Epist. 24. n. 33.

As venæsections had been repeatedly made use of, from the very beginning, to no purpose, the disease seem'd, to the physicians, to depend upon the stomach; especially as the patient was previously sensible that the fit was coming on, from the sense of a kind of smoke, as it were, rising up from the hypochondria.

Therefore, besides the more mild remedies against an epilepsy, they took care to cleanse the stomach, from time to time, by means of gentle ecoprotics; and to cleanse the intestines every day by the help of glysters.

But if any thing mitigated the violence of the disorder, it was the oil of almonds fresh drawn; which they made use of from time to time.

However, although the patient was, perhaps, never better, to appearance, than on the twenty-seventh day from the beginning of the disease; the attacks, which had been absent for some days, return'd so vehemently on this very day, that, besides the other circumstances which I have mention'd, he began to be averse to any kind of food whatever from that time: he also began to throw up; now and then, by vomitings, whatever he had taken in, to be troubled with a singultus, and to have a kind of foetid halitus; and although there had never been any difficulty of respiration, to spit up blood and putrid matter frequently.

To these symptoms were added sweats, at the time of the extreme parts being cold, and every now-and-then a delirium.

And in this manner; the symptoms sometimes being more violent, and sometimes more mild; he went on to the thirty-fourth day of the disease: and on that day, after having discharg'd by stool, bloody, grumous, and putrid matter, of the weight of almost three ounces; all the symptoms grew milder in a surprizing manner: nor did the pulse only, laying aside its rareness and hardness, return to its natural state soon after; but his former health was perfectly restor'd.

This state of health lasted about four months, till, after a short walk, and going up of stairs, those former convulsive attacks began again to come on; notwithstanding they were less frequent and shorter; and to bring back a rareness of the pulse.

It was then the month of December. From which time, to the very beginning of June, the disease still continuing, and not yielding to remedies; I was then sent for to consult with the other physicians, and heard that relation of the case which I have now given you; and found the patient to be such a one as you may learn from the letter I have mention'd.

That rareness of the pulse in particular, was found by me to be so great, that the number of pulsations was less, by about two third parts, than it ought to be: and I had the same account from the other physicians, in regard to what they had before observ'd in the course of the disease.

And this rareness, which was perpetual, and had been so for many months, was perceiv'd to be even much more considerable, as often as ever the attacks were at hand; so that the physicians were never deceiv'd, if, from the increase of the rareness, they foretold a paroxysm to be coming on: during the time of which the pulse not only became frequent, when compar'd with its former state, but so frequent, that it would have been call'd so in any patient.

When I had heard these things, and had consider'd all the other circumstances; I answer'd, that the disorder seem'd, to me, to be complicated, and therefore to be such a one as could not be distinguish'd, in every respect, without danger of an error.

For this reason, I said that nothing should be attempted rashly; but that we must make use of those harmless remedies which had been wont to bring some relief.

However, as the disorder, which had preceded some time before, the cause, beginning, and most of the symptoms of the present disorder, show'd that the nerves were affected, or at least drawn into consent; I said, that in order to mitigate, at least, the convulsive irritations of the nerves, a small quantity of opium might be tried; and if it should happen to be of any service; as it had been of much advantage in that fellow-citizen of mine (*), who labour'd under almost similar affections; that the cautious and well-tim'd use of it must not be neglected.

And indeed the celebrated Jacob Placentini, with whom I had had this consultation, related to me afterwards, that it had been tried by him; and not without some utility to the patient.

But the disorder continu'd that summer nevertheless. At the end of which; the difficulty of respiration being encreas'd, together with the cough, and the expectorated matter being ting'd with a leaden colour; the attacks were also made more frequent, longer, and more violent; and the senses, which were perfect betwixt the paroxysms, as well as the memory, seem'd to be quite gone when they were present.

Yet I learn'd, from those who had seen him on the twentieth day before death, that his pulse was strong nevertheless, but still rare. And his death happen'd, at length, on the last day but one of September, in the same year 1747; on which day three or four attacks had preceded.

As the patient always had it in his power to lie on his back, or upon either of his sides, so, in lying upon his left side, he died like a suffocated person; his tongue being thrust out, and the vessels of his face being tumid quite to blackness. From the first beginning of the disease to the very last period, that is, for fifteen months, no fever ever appear'd, nor any pain of the head was troublesome.

On the day following I was present at the dissection of the body, according to desire.

The right cavity of the thorax contain'd many pints of water resembling urine; and the left cavity contain'd a considerable quantity too, but somewhat less than the other. The lungs; which no-where adher'd to the pleura, were no-where hard, but of a cineritious colour here and there, throughout the anterior surface; when cut into, did not show the least disorder in any part: except that it was observ'd, in cutting into the superior lobe, on the left side, that, in many places, a white fluid, and puriform, rather than a purulent, matter was discharg'd; I suppose from the bronchia, which were cut into.

(*) Epist. 9. n. 6. 7.

In opening the aspera arteria also longitudinally; together with one of the larger bronchia; not the least mark of disorder could be seen on the internal surface of that artery, besides a colour degenerating from redness into brown. Within the pericardium was a small quantity of water of the same kind with that in the thorax.

But the heart was very large, by reason of the ventricles being dilated; and not from the parietes being become thicker: yet the columnæ were enlarg'd; as I particularly remark'd in the right ventricle. The auricles in like manner, and all the valves, were enlarg'd; but sound nevertheless; the orifices of the coronary arteries also, were unusually dilated.

The great artery, likewise, was wider than is natural, quite to the beginning of the curvature. On the internal surface of that artery, a little above the valves, I observ'd a few protuberances as it were; and the substance of the artery was there pretty thick, hard, and more white than usual. I also saw one of those protuberances where the same artery descended in the course of the thoracic vertebræ; for quite to that part did I order it to be open'd.

But the pulmonary artery, and the lower part of the veins of the same name, and both the venæ cavæ, near to the heart, were internally and externally in a natural state. I saw a great quantity of black and fluid blood, without any, even the most slight, polypous concretion, in both the venæ cavæ; but still more in the right auricle, and in both the ventricles.

The belly being open'd, the intestines were found to be turgid with air in some measure; the small intestines covering the omentum; which was drawn up to the stomach. The liver was somewhat hard, and inclin'd to a blue colour. The spleen was somewhat larger than when in a natural state.

The stomach was also large: and the internal surface of it was of a red colour degenerating into brown; being of a black colour in some places: and this, as I suppose, from blood stagnating there very lately; for the small intestines, also, were of a reddish colour externally.

Yet these, and the colon; when examin'd with the hand, and turn'd about to one side and to the other; had not the least mark of disease that any of us could observe. Neither was there any hardness or disorder of any kind in the pancreas, or mesentery, in like manner.

And, finally, we must not omit this circumstance; that, when first the intestines were mov'd to one side with the hand, a quantity of water, by no means inconsiderable, appear'd under them.

As to the dissection of the cranium, neither the place, nor the time, permitted us to attempt this enquiry.

6. From this full, as I promis'd you, and even prolix history; designedly omitting those circumstances which were the evident effects of the disease, and which would require a discourse longer than the history itself; I shall return only to those things which I said to the very celebrated Placentini, and that very skilful public *Professor* Mediavia; and to others who were present; immediately after the dissection of the body; I mean, that we had indeed seen a dilatation of the whole heart, and of the great artery: but that this certainly had not existed before the man's mind was struck and agitated by those very violent passions; for he was then in very good health: it there-

fore seem'd, that the beginning of this dilatation was to be accounted for, from the very disturb'd motion of the spirits through the nerves; and in particular those which go to the heart and to that artery: and from the same nerves being now and then irritated, as they go to the stomach likewise, both that sense of a smoke, as it were, rising up from thence, and those convulsive paroxysms which follow'd that sense, were to be deduc'd; and that the first, and not very considerable, slowness of the pulse was, without doubt, to be ascrib'd to a certain disorder of the spirits and nerves, which, however, was not yet encreas'd and confirm'd.

And if all these symptoms were first appeas'd by that bloody discharge from the intestines; the cause may perhaps be conjectur'd without difficulty, by those who account for this discharge from the hæmorrhoids, and are not ignorant of all the roots of the vena portarum; especially those that come from the stomach, and at length, open in common, into the trunk of that vein.

Yet we are not therefore to deny, that this dilatation of the heart and great artery; especially after it had been encreas'd; had contributed any thing to the rareness of the pulse; as both of these parts were, by this means, less apt to contract themselves than is necessary: and particularly as the nerves suffer'd distraction by reason of the dilatation.

However, that so great a rareness of the pulse is not solely, nor chiefly, to be attributed to causes of that kind, it would be easy to conceive from hence; that in so many other persons, in whom we found aneurisms of the heart, and great artery, still much larger than those, there were not pulses of this kind: so that, unless some other cause be added, it is very certain that such a symptom is not brought on.

And it is very difficult to conjecture, what kind of additional cause this can be, unless we suppose it to be a certain disorder of the spirits and nerves.

Thus far then I remember to have said at that time: and I now choose to confirm these things, as far as it is in my power, by another observation which relates to the pulse.

7. A rustic, who was already near eighty years of age, being admitted into the hospital; on account of a tertian intermittent fever; staid there so long, on the score of his poverty, after being cur'd, that, in the eighth month, he was seiz'd with a diarrhœa two or three times; and a slight fever coming on, he was gradually carried off thereby.

In this last month his urine was thick, and had a kind of milky and inodorous sediment. There was no disorder of the respiration, nor yet of the pulse; except that, having been before soft, and, as you would expect, both from the disorder, and from the age, of the patient, low and small, it was so much diminish'd on the three last days of his life, that it could not be perceiv'd in any degree.

The carcase being brought into the college, where I was teaching anatomy; for the end of January, in the year 1754, was coming on; I observ'd the following things in the belly.

Within the lower part of the intestinum rectum the hæmorrhoidal vessels were tumid. The other intestines were sound; as the stomach, pancreas, and

and spleen were also. In the mesentery indeed, there were some glands which were not small, when consider'd with respect to the age of the man; yet they were not morbid. The liver also was found; although contracted into itself, and small: and the gall-bladder was very much distended with bile.

The kidneys, if you look'd upon the external surface of them, were not in a very good state. But the bladder was perfectly found. In the mean while the scrotum; of which the man had never made any complaint in the hospital, though he had been there for so long a time; was observ'd not to be free from disorder on either side.

For on the right side, within the tunica vaginalis; which was not more moist, than it naturally is; we found two calculi that were unconnected on all sides; one being pretty large, the other very small: but both of them hard. And the left tunica vaginalis, being much thicken'd, contain'd no calculus indeed; but a great quantity of water, which resembled a lixivium in its colour.

That part also of the vas deferens, which was within the water, was much thicken'd likewise; as the albuginea which invested the epididymis also was: and the epididymis was here connected closely to the testicle, by a larger tract than usual. Nor was a roundish corpuscle wanting near to the upper globe of the epididymis; being prominent from the albuginea, and of the same kind which, as I have said in other letters to you (*y*), I have generally found in this species of the hydrocele.

In the thorax, the lungs were found to be in a sound state: and the surface of the heart was almost universally cover'd with a great quantity of hard fat. The sinus of the pulmonary vein was of such a size, that every one wonder'd at so great a dilatation; the fleshy fibres being prominent upon its interior surface.

In all the valves of the great artery, we saw the corpusculum Arantii chang'd into a small indeed, but unequal, and in part bony, excrescence: and on the internal surface of the same artery, in the whole of that tract, in which it descended from the extremity of the curvature, quite to the diaphragm, were bony scales in several places; though not large, and but thin: and from thence, quite down to the division into the iliacs, and in the iliacs themselves, were only the beginnings of those scales; but these were very much crowded together, and render'd the internal surface unequal.

The head, as I made use of other bodies afterwards, I did not examine.

8. Therefore; to omit other things, and even those excrescences of the valves of the great artery; you very well see, that there was no peculiar disorder in the pulse even from so great a dilatation of the sinus of the pulmonary vein; notwithstanding it appears that the left ventricle of the heart, and consequently the great artery which proceeds therefrom, could not have receiv'd a proper, and always equal, quantity of blood (as is naturally the case) from a sinus so enlarg'd: nor could this sinus, in like manner, admit

it from the lungs ; since, by reason of its dilatation, it was no more in a proper state to constrict itself, so as to throw out alternately, such a quantity of blood, as the law of nature precisely requir'd ; in order to make room for the new blood, that was about to come in from the lungs.

Yet there was no disorder in the respiration : which, nevertheless, has been frequent in such cases ; as I have shewn on a former occasion (z). We may, therefore, learn from hence, that not even the usual and frequent injuries do always and necessarily succeed to dilatations of the large vessels ; not to mention that most unfrequent rareness of the pulse, on occasion of which I thought proper to send you this history.

9. When I was writing to you of the inequality, and intermission, of the pulse (a) ; and enquiring whether disorders of that kind could be accounted for from polypi, as many had done ; you will remember, I think, that I paid so much regard to the doubts of that celebrated man Andrew Pasta, as to say, that until another experienc'd and learned man should arise, and very clearly, and effectually, take away from me all those doubts, I should so long be doubtful with Pasta whether polypi were form'd before death ; especially any length of time ; and yet that it was not very easy to remove from my breast these occasions of doubting.

And I am so much the less displeas'd with myself, for having made these assertions, since I have lit on two writers, neither of whom I should suppose to have known any thing of that epistle of Pasta, if they did not refer thereto. But, at least, I do not think they have read it with attention.

For both of them make some objections, which had been, already, more than sufficiently obviated by him. And one of them, moreover, thinks that all the reasonings of Pasta are sufficiently answer'd by one observation that he proposes ; as if it were really very difficult to explain that observation, without supposing the polypus to have been form'd long before death.

However, that polypus had, at least, been in the number of the few, which I also thought should be excepted. But it, nevertheless, does not belong to the species of the former ; nor comes near to the nature of those which cannot be explain'd without difficulty.

Yet, perhaps, that polypus, which was describ'd to me in a letter, bearing date the sixth of June, 1707, by that very eminent, and worthy friend of mine, John Anthony Stancari, who was, while living, professor at Bologna ; would have been difficult to account for.

The purport of his letter was, that, on this very day, had been shewn to him, by our friend Laurence Bonazoli, a segment of the vena cava of a woman, together with its emulgents ; all which veins were much dilated : being furnish'd with coats in great measure cartilaginous, and even in some measure bony ; but full of a hard and polypous substance, so that they seem'd to be entirely stopp'd up : however, in examining one of them more attentively, a kind of sinus was observ'd in that substance, through which the blood might, though with difficulty, be carried.

And he said that it was asserted to him, by Bonazoli, that the iliac veins

also, the venæ pudendæ, and even the capillary veins, throughout the muscles of the abdomen, were full of the same polypous and hard substance.

Yet as Bonazoli had open'd the belly of that woman hastily; and for no other reason, but that he might take out those parts which were necessarily to be taken out, in order to prepare the parts of generation for the demonstration it was requisite he should make, in the manner it is generally made; he had, besides those small capillary veins full of blood, but just observ'd a little serum effus'd betwixt the muscles, which was of a sanious nature, as it were; and in the cavity of the belly a very small quantity of water.

But that, beginning his preparation very late, and when the carcase was already buried, he had then perceiv'd those circumstances which I have related of the cava, and of the other veins; so that he was much chagrined, he had neither open'd the thorax nor the head, and enquir'd into the state of the veins in those parts.

And as nothing else could be learn'd in regard to the body after death, so no information could be got of her while living; except that, in the hospital of St. Mary de Morte, where she had died, she had been taken for a dropical woman; as she was universally tumid, and every-where of a livid colour, such as the skin is naturally of, where a great number of veins, turgid with blood, are lying beneath it: that she had breath'd with the greatest difficulty, and had always had a very low pulse; which, at the same time, gave but little resistance to the fingers of the physician who examin'd it.

This history I have not describ'd to you with an intention to explain it, by reason of its being imperfect; but because it, in part, comes near to that of the most excellent Haller, which I have endeavour'd to explain heretofore (b); and likewise, because it is one of the most rare at least, and that for more than one reason.

But let us go on, from those things which I have written of polypi in the twenty-fourth letter, to those that I have hinted at in the latter part of the same letter (c), upon the violent pulsations of all the arteries.

10. That these violent pulsations proceed not only from the abuse of wine, but particularly from the irritation of the nerves, I did not merely conjecture then, but even promis'd that I would, at another time, confirm to you still more, by the example of a certain merchant.

This man; who consulted me more than once, even after that time; had been begotten by a father, who was so far affected with a hypochondriac, or rather a melancholic sadness, that he sought for the end of his troubles by swallowing a large quantity of opium; and who, although he was soon after sorry for what he had done, and endeavour'd to throw it up by vomiting, yet found that his efforts were of no avail; and died by the force of the poison.

This accident struck the mind of his son, who was then a young man, with great terror and surprize. After which he addicted himself too much to the use of wine, and venery. And these abuses were succeeded by convulsive coughs, and a sense of stupor in his hands; which were at the same time so affected, that he was not able to grasp and take up what he wish'd to lay hold of.

(b) Ibid.

(c) N. 35. & seqq.

After these symptoms, at length, began violent pulsations of the heart and arteries, throughout the body: so that it was not to be doubted, but these pulsations also were brought on by means of the nerves; especially as he was frequently oblig'd to bend his head and neck, and move his shoulders against his will: and, at the end of some months, when the arteries pulsated with less violence, he was oblig'd to do these things more frequently, and in a greater degree: he likewise became subject to palpitations of the muscles; which I myself saw in the calves of the legs; and to very troublesome contractions in the limbs, in the belly, and at the heart itself: and by these he was awak'd, even when he first dropp'd asleep, and could sleep no more.

But the heart, although the arteries, as I have said, did not vibrate any more to that degree, did not only vibrate itself, but its vibrations were perceiv'd by the eye; not to mention the application of the hand; and especially in the intercostal space, at a little distance below the left nipple; where, for the extent of three or four inches, whatever was betwixt those two ribs, was rais'd up at every vibration: and if you touch'd this part with the hand, at that time of pulsation, it gave way almost like a bladder. What mischief happen'd to the man afterwards I do not know. What the disease then threaten'd, or rather what effect it had produc'd, you plainly perceive: and you are beyond a doubt sensible, from whence it had its origin.

11. Now, since we have begun to speak of aneurisms, I will not omit to add, on this occasion, what observations I have made on that subject, since the great number I sent you before. One relates to an aneurism of the heart, and the larger arteries; the other only to an aneurism of the aorta. The former of which was not suddenly fatal; but the latter almost instantaneously destructive.

12. A certain man had already lain two months in the hospital, on account of many disagreeable symptoms; all of which were in the thorax. For besides a fistula, which did not reach to the cavity of the thorax, he labour'd under a palpitation of the heart; and a greater-than-natural pulsation.

These two symptoms had begun a year before; not being constant indeed, but so frequently troublesome, that when the chest was laid bare, they appear'd to the eyes of every-one. The pulse, however, in the wrists, was not vibrating at least. But so great a quantity of puriform matter was expectorated, that, if any-one did not distinguish it from real purulency, he might suspect that this fistula penetrated into the cavity of the thorax.

At length when the patient was dead, his body was dissected by our Mediavia; who is a very eminent physician, as well as an excellent anatomist; and the lungs were found to be in a sound state.

But the heart was not found: and for that reason it was, he took care it should be brought to me into the college; together with the neighbouring part of the large vessels; when I was teaching anatomy there, in the latter part of January, and in the year 1757.

I saw, therefore, both the ventricles of the heart dilated; the thickness of the parietes, however, not being diminish'd. The trunk of the pulmonary artery was also more wide than it naturally is; but that of the aorta was very wide, quite to the beginning of the curvature: for the remaining
part

part of it was wanting. The whole internal surface of it was white, very hard, and unequal.

13. I had examin'd the same parts of a certain beggar-man, which were brought into the college at the same time of year; but two years before. What symptoms of disease this man had been previously affected with, I could not, for a certainty, learn; except that he had been affected with two slight ulcers in one of his legs, which he even then had: and that, on the days near to his death, he had been troubled with a very frequent cough; especially in the night-time, by the concussion of which I suppose the internal hæmorrhage, as you will see, to have been accelerated.

This man was brought into the hospital, in consequence of having been seiz'd with a syncope, as was said, on a sudden; wherein he was taken for a dying man; and though he soon after came to himself, he was nevertheless quite ignorant of all the circumstances which had then happen'd: he had, however, at that time, a turgid pulse, but one that did not resist the pressure of the physician's fingers who examin'd it.

This physician was Jerom Trivisani; formerly my very assiduous auditor, now a learned man, and a physician of eminence: and he it was who related these things, and the following; for he had been present; with accuracy.

When he enquir'd of the patient what was then troublesome to him, and where his uneasiness lay; he answer'd it was a pain in this place, and pointed to the lower part of one of his hypochondria.

Trivisani had scarcely gone forwards, to see the patients that lay by him, when he was suddenly seiz'd with another attack; which certainly was not a true syncope; for although there was no pulse, yet the face was rather red: and when the spiritus salis armoniaci, as it is call'd, was put under his nostrils, the patient agitated himself in some measure.

Within half an hour, therefore, from the time this new attack had begun, he ceas'd to live; the intestinal excrements, from whence that pain in the lower part of the hypochondrium seems to have been, being previously discharg'd into the bed.

When Mediavia dissected the body, he found the pericardium to be full of blood; and the great artery, in the whole of it that was in the thorax, to be dilated. He was willing, therefore, that this vessel, and the adjoining heart, should be examin'd by me.

And the heart indeed, when look'd at internally and externally, was of a proper magnitude, and in a proper state. But the artery, from its very beginning at the heart, quite to the septum transversum, was wider than it naturally is; being the less in a state of dilatation, in proportion as it descended the more: except that, in almost the middle of its descent, it grew broader for this reason; because it protuberated, on one side, into a segment of a hollow sphere, the orifice of which cavity, opening within the aorta, was two fingers breadths in diameter.

A lateral protuberance similar to this, but larger, occur'd betwixt the heart and the first branch that took its origin from the curvature of the aorta; so that, if the man had liv'd any considerable time longer, it appear'd, that to the dilated trunk of the artery, two aneurisms, in the form of sacculi, would

would have been added besides; no small beginnings thereof being evidently existing in those protuberances. The three arteries also, which proceed from that curvature, were wider than usual; and, as well as the trunk of the whole artery, distinguish'd here and there, on the internal surface, with the white beginnings of ossification: these ossifications were not large, however, nor thick, nor prominent internally; nor did they ulcerate the internal coat, as they frequently do, when they have attain'd to the hardness of a real bone: for this they had not done even where I found them carried on to this state of hardness; that is to say, in some few places of the trunk.

However, at almost the interval of an inch and a half above the semilunar valves, I saw a slight transverse fissure; which would have been equal in its length to half an inch of Bologna.

To this fissure, on the external surface of the artery, but a little lower than that, corresponded a foramen, the diameter of which had scarcely been equal to two lines of that inch: and the borders thereof were bloody and half lacerated; so that it was evident the blood had enter'd betwixt the coats, by means of this fissure; and that the external of these being, at length, broken through, it had been forc'd out into the pericardium.

14. Similar histories to these you have already had from me, particularly in the twenty-sixth letter (*d*); by way of remark to which I have observ'd many things, and among these, some that relate to the present likewise: and these, therefore, we have no occasion to repeat here.

But if you should desire rather to read observations of other aneurisms; you will find one not far unlike ours, in the *Programma* (*e*) which Waltherus, formerly an illustrious professor, publish'd at Leipzig in the year 1738: and you may find a great number of different histories, in the treatise of that ingenious physician at Pistoia, Anthony Matani (*f*), whether you would consider them as made on the heart, which he saw of a very large size, and that from perpetual gluttony (*g*), in one patient, and in another of a magnitude more than twice its natural size (*h*); or on the whole *genus arteriosum*, as in an old man (*i*), through the whole of whose body, innumerable aneurisms were dispers'd; or on the great artery, as in a young man (*k*), the cavities of whose thorax and belly were occupied with an aneurism, in consequence of an inveterate lues venerea; or in a man (*l*) whose aneurism, adhering to the oesophagus, had open'd a way for the blood through that canal, by which means the stomach was fill'd.

I could wish he had been willing, or able, to compleat the histories; by the addition of those symptoms that had preceded, which were peculiar to the aneurism; or at least by those which had appear'd last of all before death; as he did in that man (*m*), in whom the abdomen, growing tumid before death, resembled an ascites; whereas the tumour was not from water, but from blood, which had flow'd down from the trunk of the same aorta; about the emulgent arteries, where it was eroded; into the cavity of the

(*d*) n. 13. & seqq.

(*e*) De Aneur.

(*f*) De Aneurism. Præcord. Morbis.

(*g*) §. 7.

(*h*) not. ad §. 9.

(*i*) §. 27.

(*k*) §. 50.

(*l*) §. 62.

(*m*) Ibid.

belly; and in him, in like manner (*n*), whom the rupture of the pulmonary artery had carried off, by pouring out its blood, within the contiguous bronchium, as I suppose, in prodigious quantities; and from thence into the fauces.

But this is the very thing of which we ourselves, not to mention other anatomical physicians, are every now and then complaining; I mean, that we cannot always have a proper knowledge of the symptoms which have attended the disease, or preceded death: and this not only for other reasons sometimes, but frequently for this reason also, that the bodies which we, for the most part, dissect, being those of the lower classes of the people, it happens, much more frequently than we could wish, that by reason of very great poverty, or very great ignorance, their disorders are either not observ'd, or not understood.

This is the very complaint of that celebrated man Meckel (*o*), prefix'd to the first of his two sections, into which he has divided his otherwise accurate, and not common, observations of the disorders of the heart, which he had been collecting for the space of many years.

Nevertheless, read them attentively. For they deserve your notice if any others do; as they relate not only to the present subject, but are, in a peculiar manner, proper to be added to the Sepulchretum: nor are they all deficient in their signs; nay some have the history of the disease very accurately express'd.

Add to this, that explications, which are certainly very pertinent, are here and there interpos'd; and useful animadversions are thrown in, in order to distinguish the nature and seat of the disorders in question; as, for instance, that we do not suffer ourselves to be carried away, at any time, by the appearances of anxieties and difficulty of breathing, and rashly accuse the lungs of such patients, as harbouring the disease; but that, well weighing all the circumstances, we impute the disease to the heart, as it becomes us to do, where we judg'd the lungs to be sound; unless it should happen (as he has admonish'd us in another place (*p*) with equal justice) that the cause of those symptoms is in the belly; which circumstance being quite unobserv'd, is the reason, more frequently than is imagin'd, why any curative method, applied to the thorax, is hurtful, rather than salutary.

When you read those observations therefore, whether of inflammations of the pericardium and heart, and of suppurations of this viscus; or rather of the fat wherewith it is overspread; or of cohesions of the pericardium and heart, either by means of a steatomatous matter, whereby the heart is more-over compress'd; or, as more frequently is the case, by a kind of net-work, as it were, and fibres; and these tied chiefly to the apex; or of the valves belonging to the heart, being either ossified, as it is call'd, or grown tumid, so as, in part, to stop up the passage of the orifices; or, on the other hand, of the laceration, and almost total destruction of those parts; or of the enlargement of one or other of the cavities of the heart; or of the dilatation or constriction of the arteries that go off from thence; or of internal roughness,

(*n*) §. 63.

(*o*) Hist. de l' Acad. R. des Sc. de Berlin A.

1755. & A. 1756.

(*p*) Hist. A. 1757.

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small ulcers, and ossification in the great artery itself; or, finally, of the dilatation, not of one or other, but of both; that is, not only of the heart, but of the aorta; when therefore you read observations of this kind, if you happen to call to mind some that I have formerly written to you, which are nearly similar to many of these in their circumstances; I know that you will be very ready to compare them together.

And this was the reason why I pointed out these observations to you, and is the reason, at the same time, why I refer you also to a description of an aneurism of the same great artery, and of the heart moreover; which another of that famous Royal Academy, I mean that eminent man Roloff (*q*), has given.

For you may compare it with that description, which I sent to you in the twenty-sixth letter (*r*), of a man, whom the same disease of the aorta had carried off; the same bones being in part consum'd, and the blood effus'd outwardly in like manner; and you may learn why this other man did not, however, immediately perish, as mine did.

But as to my hoping, that you would find something not quite unlike the observation of Verlichius; in that dissertation which I mention'd, when speaking of the case of Trombelli in the same letter (*s*); I was disappointed in this hope, when, at length, having procur'd that dissertation, I found the question not to be of steatomata, which had been form'd in the coats of the great artery, but of concretions adhering in the cavity of this vessel, when dilated to twice its natural size: and of concretions which have not any very close connexion with the side of the artery; so that I perceiv'd these might be consider'd as polypous concretions, which had been form'd gradually, in the manner of strata, in aneurisms.

But of the two observations of the heart being ruptur'd, that I have promis'd you (*t*), and that were communicated to me, by that very eminent physician, and friend of mine while living, Laurence Mariani, we may now pass over the first, whereof he had written in the year 1750; as you will read it given at large, since then, by Galeati (*u*), the very person who made the observation, and who attended to the cure of the patient for the chief part.

The other, however, I will immediately describe, as I receiv'd it in Mariani's letters dated the fifteenth of March, in the year 1755; and that so much the more readily, because, by this means, the number of those observations will be increas'd, in regard to which there can be no doubt; if we consider those things that had preceded, and those appearances that were found, when blood was seen to be effus'd within the pericardium; whether this blood had been previously discharg'd by the force of disease, or after death by the carelessness of dissecters only: that is to say, dissecters who do not at all observe, that, while they open'd the pericardium, they had, at the same time, wounded the parts included therein; for persons are not wanting, who suspect that it might have happen'd thus, even in most of these observations; how little colour soever they may have for their suspicion.

(*q*) Hist. A. 1757. (r) N. 9.
(s) N. 40. (t) Epist. 27. n. 10.

(u) Vid. Commen. de Bonon. Sc. Inst.
Tom. 4. in opusculis.

15. A physician of fifty-eight years of age; being very hypochondriac, if any person in the world was, and of a pale and fallow complexion; was, in the beginning of the year I just now mention'd, seiz'd with a pain which rose up from the belly to the thorax; not without some convulsive motions, and an anxiety of respiration. These symptoms indeed were much mitigated by repeated blood-letting. But all the symptoms returning in the same manner, on the following day, they carried off the patient in a very short time.

The belly shew'd no mark of disorder, except in the liver, and the intestine ileum; the latter of which was livid in some degree for a considerable space, and the former of a much larger size than it naturally is.

But in the thorax we found blood effus'd within the pericardium: and this had flow'd thither, through three foramina, from the left ventricle of the heart. This ventricle was so dilated, as to form a cavity of three times the magnitude it generally forms.

16. I believe that this physician, as I wrote back to Mariani, would not have died of this disorder; or, at least, not so soon by a considerable time; if he had not been so subject to the hypochondriac disorder: and not only because he would not have been oppress'd with so frequent and strong internal and hypochondriac convulsions, from whence I account for the dilatation of the left ventricle of the heart, and, finally, the perforations thereof; the blood, for instance, being very frequently confin'd within that ventricle, which, for this reason, was irritated to contract itself more strongly, and expel its contents; but because he would have endeavour'd to obviate the beginning and progress of his aneurism, if he had not, as is frequently the case, referr'd the symptoms of it to the hypochondriac disorder.

For, without doubt, this very great detriment too frequently arises from the last-mention'd disorder, that, by reason of the greater part of the signs, which are common to this, and to organical disorders, physicians hesitate too long on the method of cure; not only in the cases of others, but particularly in their own; and readily believe the disorder to be that of the two which they would wish it to be; I mean, the more slight: in consequence of which persuasion, they neglect to do what is necessary to be done for themselves.

However, although when I promis'd you this observation, I suppos'd that the instances of rupture in the right ventricle of the heart, were much more rare than those of the left; I do not, at present, believe them to be so much more rare as I then did, notwithstanding I still believe them to be more rare.

For when I was accidentally looking for something else; in a certain dissertation (*) of the celebrated Christian Vater; I lit on the dissection of a soldier, who died in *æstu venereo*, not much unlike that which I had produc'd from Bohn (†), except that a violent and long-continu'd dancing had also preceded; and that the rupture was found to be in the right ventricle.

But besides this, I see that two examples, of the rupture of the same ven-

(*) De mort. subit. non vulg; caus. thes. 8.

(†) Epist. 27. n. 1.

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tricle from other causes, are lately referr'd to by the illustrious Haller (z). And in the works of this author, you will meet with many testimonies of other authors: but some of their books I have not by me at present; and the observations of others, relative to the internal disorders of the thorax, which I have read formerly, I am not capable of retaining in my memory: otherwise I certainly should not have omitted them among others which I have produc'd; but should, without doubt, have quoted some which would make more to my purpose, and would seem to be more worthy of your regard.

I would therefore wish you to seek them there (a), and select such observations, as you may join to those that have occur'd to me, while I was writing letters to you, wherein I consider'd the dilatations of the cavities of the heart, and the vessels adjoining thereunto; and either the cause of these, and, in particular, the disorders of the valves, or the effects thereof, as the preternatural respirations, pulses, syncopes, and internal hæmorrhages. If you do this, you will have many things to add to the Sepulchretum.

17. Before I make an end of speaking of sudden deaths, from aneurisms of the great artery, or of the heart, and their rupture; you will, perhaps, ask me whether I think that those deaths had happen'd among the ancients also, from the same cause.

It certainly cannot be denied that many died suddenly even in those times; as I remember to have shewn in other letters to you (b); and could now confirm, if there were occasion, even from Cicero himself, whose words, for instance, are these (c): “But he perish'd by a sudden death. Let us suppose it the case; yet this circumstance would not give us sufficient cause to suspect poison, by reason that many persons die the same kind of death.”

Why, therefore, may we not suppose, that, among the number of sudden deaths which then happen'd, some of this kind, whereof we are speaking, happen'd also? Is it less probable for this reason, that in those times they were more abstemious in their pleasures, and did not indulge their passions in many respects wherein the men of our days are by no means abstinent?

From their histories, and books, it appears, that they had indulg'd their passions and appetites still more. And although it by no means appears therefrom, that they were infected with the lues venerea; which, after having been, at length, brought from America into other regions, is itself also one of the great number of causes of disorders of this kind, in the heart and arteries; yet, as they abus'd the other causes of these disorders, still more than the men of our days, I do not at all see, why we should not suppose them to have been subject to their bad effects in the same manner.

And I am still more confirm'd in my opinion, when I call to mind those dispositions to these diseases, which you will remember that I have already acknowledg'd, with Lancisi (d), to have existed from the first formation of

(z) Elem. Physiol. Corp. Hum. Tom. 1.
l. 4. S. 4. § 13.

(a) Ibid. § 10. 14. 16. 18. & S. 3. § 17.
& l. 2. S. 2. § 9.

(b) Epist. 26. n. 1.

(c) Orat. pro A. Cluentio.

(d) Epist. 27. n. 6.

the animal. For who can contend that the bodies of the ancients were entirely free from these dispositions?

You, therefore, readily perceive, that those persons are approv'd by me, who have thought that nearly the same answer should be given to others, who have made the same enquiry as yourself.

18. And now I was about to seal up this letter, when an occasion was given me, of making an observation, which would naturally belong to the letter wherein we treated of the disorders of the pulse, and of the increas'd magnitude of the heart; as we do at present. I will therefore add it here.

19. A man, of almost sixty years of age, had died, in the hospital, of a difficulty of breathing, on the beginning of the twenty-sixth of January, of the year 1759. He had complain'd of nothing, from the time of his coming into the hospital, but of this difficulty; nor had he gain'd the least advantage from any other remedy but venæsection: and the advantage he gain'd from this was very little and short.

On the tenth day before his death, scarcely any pulse could be perceiv'd; and still less on all the days which follow'd: whereas the man was in his perfect senses even to the last; took his food with pleasure; and was able to move himself in bed: and indeed, if you except the last day, he was always capable of raising himself up, as often as ever any very considerable difficulty of breathing, which oblig'd him to sit in an erect posture, came on; and this action he even perform'd with a kind of impetus.

His face was of a red colour inclining to that of violets. He expectorated nothing which was morbid; except that, two days before death, some bloody spittings appear'd. As to what relates to the beginnings of the disease, and its causes; it was not in our power to learn any thing of this kind: for the man was a foreigner, and consequently not known here. Yet it was suspected that he had been given to drinking.

The belly and thorax being open'd, by our Mediavia, in the hospital, he inform'd me that in the latter was some water, but in the former a great deal more; and that the stomach was very large: in the thorax, also, the right lobe of the lungs adher'd closely to the pleura.

This lobe, together with the left, and the other parts that are within the thorax, he took care should be brought to me; according to my desire: and this he did likewise in regard to those in the belly, the large vessels, and all those that belong to the urinary organs, and the organs of generation, in general; as I was then teaching anatomy in the college.

I therefore examin'd them accurately; nor did I see any thing morbid in the lungs. The pericardium was dilated, and, as the fluctuation shew'd, contain'd a fluid, which was a small quantity of water; and that of a yellow colour; with which we soon after observ'd the internal surface of the heart and arteries, when laid open, to be ting'd universally; as they also reported the serum of the blood, when taken from the living body, to have been.

The heart was large: all its cavities except one, that is the left auricle, being enlarg'd, but the thickness of the parietes not extenuated; nay, it was even increas'd in several places, as well as the length in all the parts of the heart; and particularly in the columnæ.

The right auricle itself, being most manifestly enlarg'd both in length and breadth, shew'd the internal fasciculi to be very thick and protuberant. In this cavity was a great quantity of blood; as there was also in both the ventricles: and this was very black and half-concreted, but had nothing of a polypous appearance.

The *aggeres*, or tubercles, of the valves of both arteries, were more prominent than usual: but, although there was something of a bony formation near to one of the semilunar valves; there was no where any thing of that kind in any of the valves themselves. In one of the valves, however, which lie below the orifice of the vena cava, and, in like manner, in the lesser mitral valve, we observ'd a kind of cartilaginous hardness in some places.

The pulmonary artery was found to be not dilated, and the great artery was undilated likewise. But in this last-mention'd vessel, when laid open, quite to the iliacs, and wip'd clean; although those whitenesses, which are the marks of future ossification, were not wanting in some places; there was, nevertheless, nothing really bony any where; except in one place only, which was far from the heart, and inconsiderable in its size.

As to what remains; the urinary bladder; which I inspect'd together with those parts I have spoken of, before the seventieth hour after death; had already begun to degenerate from a somewhat livid colour into that of a green; but this was only externally: for internally it was in a natural state, as you will also learn from a circumstance, which, as I cannot explain it here in a few words, I shall not omit (*e*) at a more convenient place and time.

20. You perceive that when I adjoin'd this history, I was taken up with occupations of a public nature. For which reason you will not be surpriz'd, that I added nothing upon this subject. Farewel.

LETTER the SIXTY-FIFTH

Relates to most of the Disorders of the Belly.

1. **I**F I am not able to do in regard to the disorders of the belly, what I have done in respect to those of the thorax; I mean, to comprise all the observations you are to expect from me in this one letter only; yet at least I shall endeavour to comprehend them in as few as possible. For they are not in very great number, and most of them are but short.

However, as, for some years past, the opportunities I have had of dissecting the bodies of patients who died of disorders of the belly, have not been very frequent; so I have lit frequently on the same appearances, that others have found in the mean while; or previously thereto; in dissecting bodies of this kind.

Wherefore, that you may have wherewith to add to the Sepulchretum, I will point out those appearances to you, as I have done in the letter I sent you before; observing the order of that letter in general.

2. And first, as to what relates to injur'd deglutition, I would have you read what a kind of streightness Abraham Vater (*a*) observ'd, in the lower part of the œsophagus, from the tumefaction of its coats; and not without marks of an excrescence having preceded in the same place: and not only this, but also, if you have not already seen them, those cases that are related, from many observators, in the commentaries of the very illustrious Van Swieten (*b*), of the gula being extremely narrow, in the same, or even in some superior part; by reason of the coats being chang'd into a substance that was schirrhous, and fill'd with vomicae, or into a cartilaginous substance; or by reason of the cavity of this tube being stopp'd up, by a glandular tumour; or because some large steatomatous tumour, thereto adjacent, or a part of the lungs which had become schirrhous, press'd upon it, and streighten'd it.

In regard to men that chew the cud, there is nothing that I should add to those things which I have cursorily hinted, in the twenty-ninth letter (*c*); except that the little horn which the father had borne upon his forehead, or a little above it, does not seem to have had the least connection with the rumination of his son; since Sachsus (*d*), although he has produc'd so many examples of men that had horns, has not only not remark'd that any of these, or their sons, had chew'd the cud, besides that one; but, finally, has admonish'd us, "that most authors had pronounc'd these horns to be of the species "of verrucæ:" and who can take upon him to say, that there is the least connexion, or affinity, betwixt these verrucæ, and chewing the cud, whether he considers the origin, or the nature thereof?

And certainly, that horn, which I very lately saw on an old man, who came from a part of the country about Padua, was of the species of the verrucæ.

For he said that a verruca, or wart; which he had long borne on the left part of the sinciput; had, four years before, degenerated into this horn; and, by degrees, grown out to that length which it then was of; that is, more than four inches.

Unless you press'd it back towards the basis, the man was not in pain: nor was this surprizing; for the skin, being affected with a kind of phlogosis, as it were, about the basis, was rais'd up in such a manner, and coher'd so therewith, that you might perceive the horn to be made up of the cutis, according to the opinion of Malpighi (*e*): and, finally, what else, in fact, are verrucæ, but the papillæ of the skin, produc'd and become morbid?

(a) Disp. de Deglut. Diffic. & imped. Hist.

(c) N. 4.

(d) In Schol. ad Obs. 30. A. 1. Eph. N. C.

(e) Dissert. Epistol. de Corn. Veget.

(b) Comment. in Boerh. Aph. § 797.

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It was equal to the size of a man's thumb at its basis, from whence, like a cone that was curv'd in an anterior direction, growing gradually small, it degenerated into a point. The whole of it was of a horny hardness, and of a striated surface longitudinally; which appearance was without doubt, also, occasion'd by the intervals left betwixt the papillæ, when produc'd in a longitudinal direction.

There was this singularity in the case, that, as a shoot, or twig, raises itself up, and sprouts, from the ground which is nearest to its own tree; so from the skin, which was nearest to the side of the larger horn, another little horn had already begun to grow; being similar to the former, except that, as it was yet less than a third part of the length of that, and less than a third part of the thickness, so it was not as yet bent in any direction. But of this enough.

And in regard to pains of the stomach; besides those things which we shall take notice of below (*f*), when speaking of the discharge of cystic calculi through the narrow biliary ducts; there are many observations extant which are produc'd by Christian Wencker, together with the history of a virgin, who had her stomach perforated for seven-and-twenty years (*g*): all which, or almost all, speak of ulcers in the stomach.

In the same observations a frequent vomiting is mention'd; in one even of blackish matter (*h*): whereof mention is also made by Gothofr. Sandius, in describing "an extraordinary abscess of the stomach (*i*)."
But Jo. Kampsius (*k*) speaks of a frequent vomiting, as join'd with an incredible distension of all the vessels of the stomach, from black and sphacelous blood; and, in like manner, with a narrowness thereof, and a thickness of its coats, and almost a change of them into a cartilaginous nature: and Langguthus (*l*) mentions a frequent vomiting, from the coats of the stomach being thicken'd to an immense degree, and become schirrhous; so as every-where to astringe the pylorus, and render it very narrow: in which state it also was in the virgin taken notice of from Wencker.

And the greater part of these observations agree with those which were, long ago, describ'd to you by me. And the last, moreover, bring back to my mind the case of a man of Feltri; for whom I was consulted in the month of January, in the year 1754. The dissection of whose body I had afterwards the relation of, from the celebrated Pujati, who had then represented his case to me by letter.

3. A man of four-and-forty years of age; being absent from the place of his habitation, and travelling in mountainous and uncultivated places; took, for a slight gonorrhœa virulenta, many remedies of the mercurial kind; being such as he could get, and perhaps badly prepar'd and badly preserv'd.

While he was making use of these remedies, the stomach was not only irritated, but he was also oblig'd to vomit. From that time, whatever he ate

(*f*) N. 12. & seqq.

(*g*) Argentor. A. 1743.

(*h*) Obs. 1.

(*i*) Regiomont. A. 1703.

(*k*) De Infarct. vasor. ventric. cas. 5. & 9.

(*l*) Progr. de Tabæ ex callosa pylori angustia. Wittemberg. A. 1750.

or drank, he began to throw it all up in general: and if he did not discharge the contents of his stomach, he was much more troubled with an anxiety and pain of the stomach; wherewith he was almost always affected, but slightly; and he was troubled with a singultus also: but if he took food afresh, after having thrown up what he had taken before, he then frequently retain'd it.

He spat out a great quantity of saliva, which was thick and ill-tasted. His belly being costive, he discharg'd nothing, upon milk being thrown up, but hard globules of excrements. And, although the pulse had not any circumstance, as yet, which was contrary to the natural appearances; there was, nevertheless, a considerable wasting of flesh.

Many and various remedies were made use of against this disease; but all to no purpose: so that, at length, the poor man was under a necessity of yielding to his fate.

The stomach had its pylorus in a state of contraction, and very hard: near the pylorus was a little ulcer: and on the remaining part of the internal surface, were a great number of glands, as it were, scatter'd at some distance from each other.

4. Come, now let us touch slightly upon those things that relate to the diseases of the intestines; and first upon those that relate to the diseases wherein the stomach also is often wont to be affected.

The celebrated anatomist Phil. Conr. Fabricius (*m*) has, now and then, in dysenteric bodies, seen, besides the large intestines, the small intestines also, and the stomach inflam'd. So, in one body, he even saw the large intestines more corrupted, and cover'd over with a bloody pus; the small intestines, however, being at the same time all affected with a sphacelus, and the stomach itself inflam'd: although, in another body, he found the seat of the dysentery to be in the colon only, and the intestinum rectum.

But Henricus Henrici (*n*) found the stomach to be thin, and flaccid, in a woman whom a cholera morbus, that attack'd her very violently, had reduc'd to the most extreme weakness in thirty-five hours; and the upper part of it to be affected with a kind of spot obscurely red, and resembling a lividness from contusion; spots similar to which were here and there in the intestine colon: but these were less in their size.

And this observation prevents me from omitting my dissection of another woman, who had been carried off by a flux of the intestines: which dissection was perform'd before the latter end of January, in the year 1753.

5. The body of an old woman, who had been, by means of a long and obstinate diarrhæa, reduc'd at length to the greatest state of weakness, and loss of flesh; and even to death itself; was brought into the college for dissection. We only, however, examin'd the cavity of the belly, as we soon after got a male body; which was a much more proper subject for prosecuting the anatomical demonstrations.

The abdomen; which was so emaciated, that it had, under the skin, not an adipose membrane, (a rare circumstance even in the most lean and ema-

(*m*) Progr. quo Obs. Anat. &c. Helmst. A. 1754. M. Oct. pag. 19. & not. *v*. (*n*) Dissert. de Cholera morbo. c. 1. § 20.

ciated women) but a thin membrane, like a net-work, that retain'd scarcely any the most small remains of fat in any part of it; when laid open, had neither any ill-smell, nor immediately shew'd any thing that was worthy of remark; except that the gall-bladder, descending below the liver, and that in a considerable degree too, the bile, which was there in a pretty large quantity, and of a dark colour, had ting'd the neighbouring intestines with a yellowness, to a much greater extent than it generally does.

But neither any of the small intestines, nor the stomach, which was contracted, had any mark of disease. Only some parts of the large intestines; as those, which, in the colon, and the cœcum, are nearest to the valve of Bauhin; were internally red from inflammation.

Yet the rectum was almost universally livid, in consequence of inflammation; and was here and there tumid internally: but especially at the lower part; from whence a spot, in the form of a circle, as it were, extended itself upwards to the breadth of a man's thumb; being somewhat soft and prominent, as if it had been form'd by blood half-coagulated there, under the internal coat.

And above this part were protuberant, either true lenticular glands, or glands similar thereto; lying at a distance from each other, and being of a reddish colour inclining still more to brown.

However, some of the glands in the mesentery, although they had the appearance of being sound, were larger, nevertheless, than was suitable to that age. And there was an appearance which is pretty frequent; I mean, that the trunk of the great artery was somewhat hard in several places, and whitish, on its internal surface, by reason of many incipient ossifications.

But there was this peculiar circumstance, that if you examin'd the same surface, the coats which make up the left side, and posterior part, of the artery, seem'd to be join'd to each other at an angle; and not in the manner of a curv'd line.

6. Those things that I said just now of the rectum, bring to my mind that membrane, which hung out from the anus of a Jewish merchant (*o*), and which had not been protruded without blood and deprav'd ichor, and preceding violent pains of the same intestine; though he liv'd in good health, nevertheless, from the year 1729, to the beginning of the year 1748. I now add, that he liv'd so long as to the year 1758; in which year I have heard that he was carried off by a far different disease; that is, a disease of the thorax.

But why I make no other remarks to the observations I have given, of the man, and of the old woman, you readily perceive; as you know how much I hate repetitions, and remember sufficiently, as I suppose, what I have already written to you upon diseases of this kind (*p*). And this I would have you suppose to be said of the greater part of the other observations likewise, which will be taken notice of below.

Of the imperforation of the anus in particular, and of the prolapsus of it, I have nothing to add; except that I lately read an observation of the

celebrated Philip Adolphus Boehmerus (*g*), made upon the dead body of a new-born infant: to whom it had happen'd, by reason of the anus being imperforate, that, from a part of the intestine colon; which had been seiz'd with a sphacelus, and ruptur'd thereby; so great a quantity of meconium was pour'd out, that the abdomen was very tumid and hard.

I have likewise read, in the history of the Royal Academy of Sciences (*r*), the account of the dissection of a boy of three years of age, who had always discharg'd the intestinal excrements through the urethra; into which the rectum intestinum terminated: and the cause is there shewn why these excrements were at length retain'd.

And in regard to the prolapsus ani, that which the illustrious Haller signified to me by letters, dated the twenty-seventh of January, in the year 1758, I will here faithfully copy to you.

"I lately saw," says he, "a surprizing spectacle; and one which I should scarcely have given credit to, if it had been related to me by another person; I mean a prolapsus of the large intestine, in which you might see the valve of the colon itself; being very easy to be distinguish'd, and lying open. The villous coat was very red; and when sprinkled over with nitre, sweated out a fluid: but was in other respects unmov'd. The disease is of long standing: the intestine has often been replac'd to no purpose; as it every-now-and-then slips out again, and the surgeon, during that operation, evidently feels the stomach, through the colon, with his hands."

7. But to the pain of the intestines, and even to the iliac passion, relates the programma of the celebrated Kaltschmidt (*s*), which will afford you pleasure and profit in the perusal.

For besides that he found the whole tract of the intestines inflam'd; and most in that part where the ileum was torn asunder, near to the valve of Bauhin; he saw this intestine quite obstructed, and not only in that part, but for the length of an ell, with fœces so hard, and so compacted together, that a pound of quicksilver, which had been given to the patient, could not make its way through them: he remark'd other things moreover, and among these the cause of preternatural hunger, wherewith the man had been frequently troubled; that is to say, the pylorus twice as large as it generally is in other bodies.

I who have already sent you many observations upon the iliac passion heretofore, will now add only one upon the pain of the intestines: and this I made in the college likewise, at the same time of year as I made the former; but in the following year 1754.

8. An old woman, of fourscore-and-six years of age, who had formerly been a cook, had already labour'd under a paralysis of various kinds, in the lower limbs, for fifteen months; the three last of which she spent in the hospital; when being there, at length, seiz'd with an acute fever, and a pain under the region of the hypochondria; not without great thirst, and a redness

(*g*) Vid. Act. Erud. Lips. A. 1758. M. Januar.

(*r*) A. 1752. Obs. Anat. 4.

(*s*) De Ileæ a scrupul. piror. mespil. perfor. Jenæ A. 1747. M. Octob.

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of the cheeks ; and all these symptoms continuing ; her life was brought to its final period within seven days.

The abdomen, when look'd upon externally, shew'd no disorder, but a little tumour in one of the groins : and this I took for a hernia ; nor was I deceiv'd ; for I soon after saw that it contain'd a small part of the intestine : and indeed, I should have consider'd it as the cause of the pain, if the woman had ever complain'd of that place ; and particularly when the pain was violent.

But while the abdomen was incis'd, I saw that the muscles thereof were green ; and when the cavity was laid open, that the intestines and mesentery were variegated with green and red ; and were infected with a very violent stench : so that, although the body was open'd at only the third day after death, and at such a time of year, it was necessary to bury the carcase immediately ; after having just observ'd a few things, which I shall immediately inform you of, in the genitals and the liver.

The vagina had some spots on its internal surface, lying at a distance from each other, and degenerating from a red colour, into that of a dirty yellow. Of the testes, there were but the most inconsiderable remains.

The latter of these circumstances is to be ascrib'd to age ; and the former to inflammation, which that part had contracted from the neighbouring intestine, that was already beginning to degenerate into a gangrene ; as to the beginning of a peculiar disease, is to be ascrib'd a slightly unequal protuberance, of a red colour, inclining to blackness, which was prominent from the upper and internal side of the fundus uteri ; and, by dissection, seem'd, in part, to be made up of a few vesicles full of a fluid.

And in the liver were peculiarities, some of which were to be deduc'd from the original formation ; others, probably, from early youth ; and others entirely from disease. From the original formation may we deduce that unusual figure of the lower border, so that being deeply curv'd into the form of an arch, betwixt the right and the left lobe, it had the right lobe on one side, and the left on the other, going down to an almost equal extent, which at other times the left lobe is not wont to do : and from early youth ; if any place is to be given to the suspicion which I formerly (*t*) communicated to you ; that of a deep parallel sulcus, passing over the convex surface of that viscus, from the upper part towards the lower ; but, certainly from disease, two hydatids upon the same surface ; one on the right side, and the other on the left ; both of them cover'd with the coat of the liver, both of them surrounded internally with a membrane, which ; being unequal with rugæ, or rather with a kind of bands or fillets, as it were ; contain'd, in the former, a considerable and very deep cavity, and in the latter a very small one.

From these hydatids, and still more from that rare figure of the liver, you perceive that this was the old woman, from whom I was willing to describe, more fully and clearly, both these circumstances, which I only hinted at before (*u*) in a cursory manner.

9. But now to those observations which I have produc'd, when writing to

(*t*) Epist. 56. n. 17.

(*u*) Epist. 58. n. 42.

you of pain and tumour in the hypochondria, I would have you add these, some of which relate to the liver, others to the spleen, and one of them even to the stomach; and in regard to the liver, that in particular wherein (*x*) a vomica thereof is describ'd, which "open'd into the right cavity of the chest."

I heartily wish the very ingenious Richertzius could have inform'd us, what symptoms had preceded death, as well as have describ'd with exactness and accuracy, the appearances which he found in the body after death.

For you will, without doubt, remember, that, when I wrote to you (*y*) a very rare observation, and perhaps the first of a case of that kind, from the papers of Valsalva, I complain'd of the deficiency of a great number of circumstances; although he did not fail to remark many things which had existed in the patient.

And that I the more complain of in this other observation, in proportion as it appears; from the inspection of the right lobe of the lungs, and from the inspection of the pleura on the same side; that the patient had been troubled for so long a time, with an empyema of that singular kind; and from the magnitude of the liver, and the purulent cavity in it, that he had suffer'd the most violent uneasinesses there also.

There, I say, for at Paris it happen'd, when a certain patient (*z*) complain'd "of a very great pain in the right hypochondrium," that, though the surgeon denied the pain to be seated in the liver, contrary to what the physician had pronounc'd, the liver was nevertheless found to be "inflam'd," when the body was open'd after death.

But if, by reason of "some delirium being join'd, at intervals," to the inflammation of the contiguous diaphragm; which however neither the surgeon, nor the celebrated author, would have conceal'd; you should choose rather to suspect the cause of the pain to have consisted therein; you must first consider other observations, and among these some which relate to the discourse I have begun.

For I do not doubt, but that woman was afflicted with considerable uneasinesses in the same hypochondrium also, in whom, as you may see in the same place (*a*), the liver was found to be large, and not inflam'd; though it is to be lamented, that those symptoms, which appear'd in the living body, could not be made known.

But I certainly know, that, in the dissertation of the celebrated Rudolphus Jacobus Camerarius and Jonas Brunnerus, which recounts "the appearances found in the viscera of those who died of an hepatitis (*b*)," the case of a woman, and of a young man likewise, is produc'd; the former of whom having made "a very great complaint of the right hypochondrium," and the latter having had "an almost intolerable pain" in the same place; the liver was in both of them very large and hard, from a calculous matter; and, in the woman moreover, encreas'd by a very considerable atheroma.

(*x*) Observ. Viscer. Abdom. Labis Epicris. Obs. 2.

(*y*) Epist. 36. n. 4. & seq.

(*z*) Vid. Bulchwald. Obs. Quadrig. Obs. 2. Ætiol. §. 9.

(*a*) Obs. 2. cit. (*b*) cit. 1.

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Now then, will you ascribe all the pain, in these patients likewise, to the adjacent parts, which the tumour and weight of the liver compress'd, and drew downwards?

If you think you may take upon you to make this assertion the more freely, because a calculous matter had obtunded the sensation of the liver; whatever this sensation may be; by indurating it; I shall not be very obstinately averse to your supposition: for in whatever manner you choose to explain the case; the observations which I have here added to the former, will always relate to pains and tumours of the right hypochondrium; as I have promis'd you they should; in the same manner as those which immediately follow will relate to the left hypochondrium.

10. That tumour of the spleen was certainly large, especially as it was in a boy of nine years of age, which is describ'd by the celebrated Kaltschmied (c); in which tumour, if examin'd with the hands, the boy perceiv'd a pain; unless you should choose rather to attribute this to the enlarg'd pelvis of the subjected kidney, which was then press'd upon, and prick'd, by a rough calculus therein included.

But sometimes, on the contrary, the pain is not found to be in the tumour of the spleen, but in the lower part of the left side which inclines to the back; as in a man, who, having been afflicted with other symptoms besides, which resembled a phthisis, shew'd at length, after death, nothing at all morbid in the lungs; but shew'd an enlargement of the spleen, which was likewise very hard and heavy, in consequence of being made up of a dense substance, which Abraham Vater (d) compar'd to a gammon of bacon somewhat harden'd by the "smoke."

The tumour of the spleen is also deceptive, when it extends itself greatly; or when it contains what it is very rarely wont to contain. And an example of both these states taking place, at the same time, in one and the same man, you will have from the History of the Royal Academy of Sciences at Paris (e).

For he being seiz'd with the signs of an ascites; among which was a very manifest fluctuation of a fluid in the belly; and having twice undergone the operation of paracentesis, and had pus drawn off instead of water; and having died the day after the second operation; had the spleen enlarg'd to such an enormous size, that, reaching from its natural seat to the bones of the pubes, it cover'd the viscera before and on the sides, and compress'd them all, in consequence of its containing as great a quantity of pus, as had been drawn from the living body; and a very great quantity had been drawn.

That pus indeed, as well as water, has been sometimes found in the spleen, I have taken notice to you before (f); but I do not remember that it has been ever found in such an immense quantity. In so great an extension of a viscus, which is not large, and a sensation of a fluctuating fluid, who would have blam'd the spleen in particular? The seat of the pain, except in the beginning perhaps, could not have shewn this.

(c) Progr. de hoc Tumore.

(d) Dissert. de Schirrhis Viscer.

(e) A. 1753. Obs. Anat. 5.

(f) Epist. 36. n. 18.

For the violent colic pains which had at length come on, could not be confin'd to that one part of the belly only; as they certainly were from the compression of the intestines. The only circumstance from whence a suspicion might arise, was, that the disorder had succeeded a quartan fever, which lasted eighteen months or more.

In that admirable case also, which you will read of in the very excellent Fantonus (g), who would have suppos'd, that, in an abscess open'd at the navel, the spleen lay hid? It was only the most slight conjecture, that could be drawn from those very violent pains, of which the patient had complain'd; and especially below the left hypochondrium.

Yet the spleen had fallen down to the navel, from whence it was not only extracted at that time, but the woman having died five years after this extraction; and having conceiv'd and brought forth in the mean time; left any one should doubt of the extraction of this viscus, no spleen was found in any part of the body upon dissection; "only cicatrices appear'd in the neighbouring parts; to which it is wont naturally to adhere."

11. But because there is another viscus in the left hypochondrium, besides the spleen; I shall presently point out a singular history of the tumefaction of this viscus also; if you will first give me leave to speak of the spleen being ossified, or become stony; and add this; for you will remember I have written to you on the same subject before (b); that I observ'd, in an old man, already taken notice of in the sixty-second letter (i), an account of the oblique figure of the cranium.

A part of the membrane of the spleen; as much as could be cover'd by a circle, the diameter of which was equal to two fingers breadths; seem'd to be become stony: and the substance of the viscus adher'd closely thereto.

Having taken off this part of the membrane, and macerated it some days in water; and scrap'd away the adhering substance of the spleen; I saw that there was nothing else remaining in the membrane, but a thin, and in some places deficient, incrustation of a matter evidently tartareous.

I was not sorry, therefore, I had left a place for tartareous matter in that thirty-sixth letter likewise; nor yet that I had said this induration generally begins from the convex surface of the spleen, and extends itself from thence to other parts.

For, when I took away the membrane next to the indurated part, I did not indeed perceive it to be very hard, but grown rigid nevertheless: and all these circumstances I saw in that surface of the spleen which was contiguous to the diaphragm.

But whether I rightly conjectur'd, that this might be ascrib'd to the alternate compression of that muscle, I sometimes doubted since then; as I have observ'd that the surface of the liver, which is liable to the same compression, does not contract the same induration, unless it be very seldom, and by accident.

(g) De Obs. Med. & Anat. Epist. 1. & 6.

(i) n. 16.

(b) Epist. 36. n. 14. & seqq.

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Now I will point out that singular observation of the stomach swelling continually, and not without uneasiness, from Lieutaud (*k*).

The patient complain'd of a sense of plenitude, or weight, in the region of the stomach, which was always more elevated than it naturally is; he being at first cachectic, and after that dropical; and of certain pains about that region, which were by no means acute. Deglutition was quite easy and free: but the belly was costive; so that, without giving purgatives, there was no discharge at any time, and even then but little.

There was a nausea, and an inclination to vomit: but neither nature nor art could actually bring on a vomiting: and, although very little aliment was taken in, during the whole course of this disease; and though in the latter part of it scarcely any thing was taken; yet that sense of plenitude, or of weight, did not by any means decrease.

Finally, after death the stomach was found to be immoderately extended and full: and all the intestines; though so narrow, as not, in the whole of them, to exceed the bulk of the stomach; were perfectly pervious, as well as the pylorus; so that it was natural to think, from these appearances, which were seen in the dead body, and from what had been observ'd in the patient when living, that the disorder ought to be referr'd to a kind of paralysis of the stomach.

And, since we are speaking of tumours of the belly, I will not scruple to assert, that, if this patient had liv'd some time longer, a tumour of another kind would certainly have made its appearance, in the same side of the belly. For the cause of a very severe pain, which had arisen there fifteen days before death, was found to consist in blood effus'd betwixt the oblique muscles, on the left side, to the quantity of two pounds.

But even the right hypochondrium was not without disease. For the liver contain'd many very solid stones; some of which were very evidently prominent above the surface of that viscus, and were nearly of the size of a filbert.

12. And in regard to these calculi; which were, without doubt, of the biliary kind, whereof I have already written many things (*l*) to you, and not only of hepatic calculi, but of cystic also, and that chiefly; a few things now remain to be added: and first I shall give you an observation from a letter, which happen'd lately to fall into my hands again, and had been sent many years ago by a physician of some note, who had formerly been my very attentive auditor. And thus it was that he wrote what he himself had then been witness to.

13. An old man, who had reach'd quite to his sixtieth year, without any disease that was worth notice, was seiz'd with violent pains at his stomach; with a bilious and copious vomiting, attended with obstinate costiveness, and a fever not of a very acute kind.

The physician, by giving him fresh-drawn oil of almonds, and some other remedy of that kind, mitigated the disease, but did not carry it off; the pains still returning every-now-and-then; till at length two drachms of mag-

(*k*) Mem. de l'Acad. R. des Sc. A. 1752.

(*l*) Epist. 37.

nesia being frequently made use of, the patient seem'd to himself to be perfectly cur'd.

But having, contrary to the advice of his physician, return'd to his former cares and occupations, and eaten unwholesome foods; his pains return'd also; but were soon driven away by the use of the magnesia.

In a few days, however, the physician was much chagrined to find, that the pulse was become small, and had even some little intermission; that the appetite for food decreas'd; but particularly, that, some days after, the patient discharg'd, by stool, a quantity of black matter, which resembled the atra bilis of the ancients.

Finally, a very considerable fainting-fit having come on, and soon after gone off, the patient began to be somewhat delirious, and to complain of a very violent pain in his head. After seven days, therefore, being spent under the influence of these disorders, (that is, about the sixth month from the beginning of the disease) not without intermissions of the pulse, and great dejection of the strength, he died.

The abdomen being open'd and laid aside, no disorder was found in the stomach; nor in the liver, except that it was somewhat paler than it generally is. But the vesicula fellis was almost three times larger than it naturally is; and contain'd a very black bile, or rather dregs or lees of bile, in which were eight calculi of different figures; and all of a very extraordinary magnitude: besides which, others were seen, to the number of ten, in the very parietes of the vesicle; being not larger, in their size, than the granules of millet-feed.

14. These very small calculi, observ'd in the parietes of the cyst, certainly belong'd to the class of those which I have heretofore taken notice of in the glands of this vesicle; or at least betwixt its coats (*m*).

And perhaps some calculi a little larger than these; by endeavouring to pass through the cystic and common duct, though not observ'd in the intestinal fœces; excited those pains of the stomach, and vomitings: whereas those eight very large ones, which lay still in the vesicle, by reason of their magnitude, did not give the least token of their existence; not even by a sense of weight; perhaps because we easily accustom ourselves to any sensation, which comes gradually upon us.

You see here also, that no mention is made of the jaundice. And certainly that very noble man; for whom I was not long ago consulted by letter; after having spent all his nights without sleep, for a long time together; by reason of a very violent pain, wherewith he was seiz'd, at the region of the pylorus, and perpetual efforts to vomit; did but just, at length, begin to be somewhat ictical at intervals.

Yet the cause of the disease was shewn by the cure; for the pain descended gradually from the stomach towards the navel, and from thence to the region of the pubes, where it remain'd some days; and, at length, by the discharge, from the rectum, of two bodies not very small, and almost of a cubical figure, all pain, of both the stomach and liver; for this viscus was in pain; as well as all pain of the intestines, was carried off,

(*m*) Ibid. n. 21. & 29.

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These bodies were of a yellowish colour, and made up of strata, containing a nucleus, and catching flame; so that, considering all circumstances, you would not doubt but these were cystic calculi. Yet see how much difference there is in the same disease, in different bodies.

Fr. Slare (*n*) observ'd, that a noble woman, who was very much tortur'd with pains of the liver, had perceiv'd great ease "immediately" after having discharg'd, into the intestinum duodenum, two cystic calculi at different times; and that those calculi had remain'd, "but a few hours only," in the whole course of the intestines, notwithstanding they likewise were by no means small; for one exceeded the diameter of the middle finger, and the other, though somewhat more slender, was not much so nevertheless.

But in regard to calculi of this kind; those things which the very excellent Ellerus (*o*) has written on the subject, it behoves you to read: and his explication of the nature, and origin, of that stone in particular, which had been discharg'd through an abscess of the right hypochondrium, together with the pus, you will doubtless, confirm by those three similar examples, which I have given you in the thirty-seventh letter (*p*).

And you will, at the same time, learn, what this very experienc'd man has also advanc'd, on that occasion, in regard to the origin of renal calculi; and even of a stone which he saw lying hid betwixt the coats of the urinary bladder.

But to other disorders of the kidneys relate not only the dropsy of these viscera, or a distension thereof by yellow serum, but the case of their substance being in great measure annihilated, and of their adipose membrane being indurated; and, in like manner, in a woman troubled with an ascites, that of one of the kidneys being enlarg'd to twice its natural size; the other being less than it naturally is, and having the ureters, and the blood-vessels, extremely contracted.

These observations of Bohemerus, you will find related in the same book that others, which I pointed out to you above (*q*), are related.

And if in turning over that book, you should happen to light on a passage, where *Morgagnus* is said "to have endeavour'd, lately, to confirm, by new" arguments, the opinion of a passage, for the urine, from the stomach to "the bladder;" do not be surpriz'd, as you know that I was always in the contrary opinion, and still am so; but ascribe it to the profuse liberality of the printers towards me: for, by adding one single letter, that is *g*, they have been kind enough, more than once, to pay me the compliment of things which belong'd quite to another person.

15. Those things which I said just now of calculi, do likewise relate to disorders of the belly, as well as the preceding; and not only thereto, but also to the discourse of tumours of that cavity, which I had begun, and which I probably seem'd to you to have forgotten, relate those observations that I lately pointed out from Bohemerus, of the dropsy of the kidneys, and of the ascites.

(*n*) In Epist. edita a Sigism. Koenig in suo Lithogen. hum. Specim.

(*o*) Hist. de l'Acad. R. des Sc. de Berlin, A. 1755
(*p*) N. 52.

(*q*) N. 6.

And the programma, publish'd by Hamberger, *De Ruptura Intestini Duodeni*, may contribute to illustrate some things which we have hinted at, when treating of the tympanites; as this rupture of the duodenum was follow'd by a very short indeed, but very great, and fatal, tumour of the tympanitic kind.

I would, therefore, wish you to read it over again. For, as I consider the many and various things which I have written to you, upon other tumours of the belly; and likewise that not a few things must be said presently, on the subject of another droply; I cannot insist much now upon every-thing that may arise.

Wherefore, I shall here say nothing more, in regard to the mesentery, but that I would have you take out, from the writings of those celebrated men Henricus Henrici (*r*), and Joannes Fantonus (*s*), the observations which then escap'd me, and which may be join'd to the Sepulchretum. For the latter has given an account of a large tumour of the mesentery; and the former of a considerable number of abscesses of the same viscus.

And these observations are indeed useful; but more useful still are those wherein the seat of the viscera being chang'd, the physician may be deceiv'd thereby. We will therefore add as many; which you may join with that remarkable one of Valsalva's (*t*), of the stomach being prolaps'd out of its seat, and forming a tumour, in a part where the stomach is not wont to be naturally.

One of these is that very observation, which we have in part taken notice of above (*u*), from the celebrated Langguthus: for, as a schirrhous tumour of the coats, which surrounded the pylorus, had streighten'd this orifice by its immense thickness; so, by its weight, it had mov'd the stomach quite from its place, and made the upper orifice thereof be distant from the diaphragm, by the space of a very large span; at the same time that the fundus was stretch'd out below the navel, into the hypogastric region; and, by its situation, and moveableness in the living body, resembled a large tumour form'd upon the omentum.

And the other observation is that of the celebrated Schlenker (*x*), who saw the stomach "reaching from the pylorus quite to the os pubis, in a perpendicular line." The proper cause of which prolapsus does not appear from the remaining part of the history; for the principal disease, on account of which he then wrote, was among the other viscera of the belly, in the left ovary, which was "stony, large, and ponderous;" and well deserves to be put in the list of those tumours of the ovaria, which I have taken notice of heretofore (*y*), and that in considerable number.

Among these tumours, however, I believe that some spoken of by Fantonus, whom I have so often commended (*z*), are deficient; as when the left ovary was ten times larger than its natural size, and schirrhous; or when the right ovary contain'd within it a hollow, whitish, and hard globe, made up

(*r*) Dissert. de Abscess. Mesent.

(*s*) De Obs. Med. & Anat. Epist. 8. n. 9.

(*t*) Epist. 39. n. 14.

(*u*) N. 1,

(*x*) Dissert. de Singulari Ovar. sine Morb.

(*y*) Epist. 38. n. 54. & seqq. & Epist. 39. n. 37. & seqq.

(*z*) Epist. cit. 8. n. 13. & 16.

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of a sebaceous matter, and similar to a pigeon's egg; or, finally, when both of them were turgid with a yellowish serum, in the manner of a distended bladder.

16. But, although I have not taken notice of a greater number of examples of tumours in the testes of women, of any species, than of this third; when, writing to you upon the encysted dropsy (*a*), I at length went so far as to enquire, whether, and in what manner, dropsies of the peritonæum, of the tube of the uterus, and others of that kind, can be distinguish'd from the dropsy of the ovarium; yet some observations of the same kind remain, which I think it would not be without advantage to point out; briefly indeed, but in such a manner, that you may easily compare them with the former; and with those which I then spoke of; and determine what seems the best method to you, not only in distinguishing, but in curing disorders of this kind.

To begin with the more ancient, and come down to the more modern; in the year 1671, was publish'd, by Ludovicus Salzmänn (*b*), an instance of a woman, in whom, after a long-continu'd suppression of the menstruous blood, the abdomen was gradually rais'd up from the left hypogastrium, towards the left hypochondrium; all symptoms of an ascites being absent, and the face being of a pretty good colour.

But from the time that she fell upon the ground with some impetus, the signs of an ascites soon came on, together with a large tumour of the whole abdomen; and soon after she died.

In the belly; besides water, and pus, in such a quantity as was to be expected from so great a distension; a large tumour was found covering the viscera, containing many cysts of different magnitudes, and each of them in general fill'd with a different matter.

And as to the common coat of the tumour, although it was every-where connected, by membranes, to the contiguous parts, and the uterus itself was found; yet, as the tumour had begun in the living body, "under the left groin," and is said to have been seen there, in particular, in the body after death; you will not quite give up all pretences to speciousness and probability, if you suppose it to have taken its origin from the left ovarium: although you would, perhaps, rather chuse to refer it to the class of other encysted dropsies, and dropsies that have arisen from other parts.

Of which kind that certainly was, whereof I read, not long ago, among the medical observations of the celebrated Welspremus (*c*), as found after death in the body of a man, who; having been consider'd, for two years together, as a person labouring under an ascites; shew'd a strong-smelling fluid, in which swam large hydatids, to be shut up within a kind of vast bladder, the neck of which was implanted betwixt the true bladder, and the intestinum rectum; whereas the remaining part was connected to the neighbouring parts only by a cellular texture.

And of this kind, except that no hydatids were contain'd in the limpid water, I now see, from the history more accurately describ'd by the celebrated

(*a*) Epist. indicatis 38, & 39.

(*c*) Obs. 11. Cas. 1.

(*b*) De Abscessu interno miræ magnitud. &c.

Steubius (*d*), that the dropsy, upon which I was before with good reason doubtful (*e*), really was; I mean the dropsy of a virgin, whose belly having been tumid for ten years together; although it was most prominent on the left side; had not the marks of an ascites join'd with it; but was even attended with a florid colour of the face: yet she; being also very rashly suppos'd to be affected with an ascites, and, for that reason, thought a proper subject for the operation of paracentesis; had no sooner undergone the puncture, but too great a quantity of water was immediately drawn off, and sudden death by that means brought on: yet, upon dissection, appear'd a membranous sac, wherein the water had been contain'd; being connected to no other parts but the spleen and the left kidney, wherewith it so firmly adher'd, as to have its vessels in common with them.

Therefore, that I may refer you to other observations of dropsy in the ovaria, whereof you cannot doubt; let us come on to those authors who have publish'd their observations since Ludovicus Salzmännus, according to our promise.

Abraham Vater (*f*) has describ'd a woman, who could not; like the two of whom we spoke just now, and others (and amongst these a widow, of whom I shall speak presently) who were falsely suspected by the physicians, in the first year of their disease, to be pregnant; which circumstance, in proportion as it delays the cure for a longer time, renders it more difficult in proportion; who could not, I say, be assur'd with a suspicion of that kind, as not other persons only, but she also suppos'd herself to be pregnant by her own husband: and her breasts being now turgid with a fluid similar to milk, she affirm'd that she could even, by the application of her hand, perceive the motions of the infant; motions which were well known to her, in that part, from the time that she had borne, in the uterus, twins, whom she brought forth by a very difficult birth: but as, after having a very violent fall, she felt these motions no more, she had no doubt, through the whole period of her life; and she liv'd three years and a half; but the foetus was dead: the tumour of her belly remaining very hard indeed, but not being so heavy at first; yet being after that encreas'd to a surprising degree, and become troublesome.

In the belly of this woman, therefore, was a very large tumour, with a very great quantity of the most foetid water: and this tumour did not belong to the uterus, which it had push'd down into the vagina by its weight, but entirely to the right ovarium; the whole of which had been chang'd into round capsulæ, fill'd with a viscid and purulent liquor.

But this tumour is very far exceeded, by that which we may read of in the dissertation of the celebrated Nicolaus Willus (*g*). For the abdomen having begun to swell, gradually, in a widow, at the same time that her strength and appetite were quite entire; her habit of body not being cachectic, and her urine being naturally excreted; in the space of five years it grew out into a very large bulk, but had an unequal appearance however;

(*d*) Dissert. de infelici hydr. saccat. curat.

(*e*) Epist. 38. n. 63. in fin.

(*f*) Dissert. inscripta Graviditas Apparens.

(*g*) Dissert. inscripta Stupendus Abdom. Tumor, n. 5.

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for it was most prominent on the right side; nor did it give any sense of fluctuation when she turn'd herself from side to side in her bed.

And, indeed, although, within the space of some years, it was so encreas'd, as to hang down to the length of a span below the knees, as the patient lay continually very high in the bed; though, at the same time, she was a very tall woman; neither were her feet swell'd, nor her face much discolour'd, nor her appetite decreas'd: nor had she any thirst, except in the morning, and then only a slight one, nor any febrile pulse; nor was she disturb'd with unquiet sleep.

But the disease continuing after that, so long as to the twelfth year; and the abdomen being more swell'd; most of these circumstances were at length chang'd: and, although from the tumefied and eroded feet, a great quantity of water distill'd, yet the tumour of the belly was not decreas'd thereby; and the feet being seiz'd with a gangrene, death came on in consequence thereof.

No water was found in the belly, in the thorax, or the pericardium; the vast quantity thereof being entirely shut up within a membranous sac. The coat of the sac was double; the external coat being white, thick, and made up of tenacious fibres: the sac had only one cavity and one origin; for the right ovarium had grown out into so surprizing an extent; the spermatic vessels, which belong'd thereto, being twelve times thicker than they are wont to be naturally.

17. In the same dissertation (*b*) also, you will find the marks collected whereby this dropsy is suppos'd to be known and distinguishable from others; particularly from those of the uterus itself; and you will also see (*i*) how various it is found to be in various bodies.

And; in comparing all these cases with other examples that I have produc'd heretofore, or at present; you will plainly perceive, what occurs more frequently, or more rarely, both in the living and the dead body: but if you attend to my caution, you will not, for that reason, take upon you to affirm any thing, for a certainty, in making a diagnosis; and still less promise any thing efficacious, from any method of cure whatever; and especially from the chirurgical method.

For whatever some authors may assert in their writings; the learned author of the dissertation himself, also, expressly confesses (*k*), "that no medical practitioner whatever has hitherto been able to boast, that he had absolv'd himself of his engagements, after having promis'd to do a great deal in this dropsy of the ovarium:" and although, where he speaks of trying the operation of paracentesis (*l*), he neither omits to mention the place where the puncture should be applied; nor the manner of applying it; nor the method of cure, in particular, which must be follow'd, in order to make the parietes of the tumour coalesce with each other; yet he first of all admonishes the physician and the surgeon, that they do not fail "previously to pronounce the event," of that method of cure, "to be doubtful."

(*b*) n. 9.

(*i*) n. 10.

(*k*) n. 16.

(*l*) n. 18.

For he particularly urges and inculcates this consideration (*m*), that the signs are yet wanting, whereby we might determine; before that cure be undertaken; whether the water is collected within one cavity, or dispers'd into many.

And you see, that; though it had even come into my mind (*n*), to conjecture this difference, from the fluctuation being sensible at one time, and not at another; this ground of conjecture must, nevertheless, be totally, and beyond a doubt, rejected, from considering the history of the widow last spoken of.

I omit other difficulties, which have either been sufficiently observ'd already, or explain'd to you in other places: to which I would rather have you now add, those that are drawn from the observations of the celebrated man George Christian Brehmius (*o*), and Stephanus Weszpremus (*p*); neither of which I have taken notice of before, because the latter is without the signs of the disease, and the former complicated with the diseases of many parts.

For what must the surgeon do, if, as the second of these gentlemen did, he should light on a large sac, containing, together with a foetid humour, a very considerable bony concretion; which sac is shewn to have belong'd to the left ovary, by a kind of small rope, whereby it was connected thereto; though the greater part of this ovarium, together with the neighbouring tube, and the ligaments of the uterus, was putrified and lacerated; so that it was very natural to conceive, from whence the ascites of this virgin had taken its origin? Or what must the surgeon do, if, after many signs of an encysted dropsy, the trocar being plung'd, to a considerable depth, in the softest part of the tumour, a small quantity of glutinous water, and a great number of hydatids, should be discharg'd? for these were found, by Brehmius, in an almost incredible number after death: extending, together with a very thick schirrhous flesh, each ovarium "to the size of two fists;" and even besetting almost all the viscera of the belly and the diaphragm in like manner.

18. It does not seem, therefore, that any other method of cure can be, with any degree of prudence, recommended in cases of the encysted dropsy, but that which I have already recommended (*q*); I mean, the palliative method.

For by these means, patients might have liv'd much longer very frequently, and labour'd under fewer and slighter inconveniences; and, indeed, after living many years in this manner, might, sometimes, be cur'd by the assistance of accident and nature co-operating together.

See what happen'd to the virgin, the accurate description of whose history we owe to the diligence of Villus (*r*).

For this virgin, having labour'd, for fourteen years together, under so great a bulk of belly, that, within the first eight years, her body weigh'd

(*m*) Ibid. & n. 16.

(*n*) Epist. 38. n. 64. in fin.

(*o*) Dissert. de Hydatidib.

(*p*) Obs. Med. 1.

(*q*) Epist. 38. n. 71.

(*r*) Dissert. ad n. 16. supra cit. n. 6.

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twice as much as before the disease began ; that is to say, when she was two-and-twenty years of age ; she at length fell down upon her belly ; and a cracking noise being perceiv'd in the left epigastric region, similar to that of the bursting of a drum (which circumstance, and the beginning of the tumour from the same side of the pelvis, and even some signs which accompany dropfies of that kind whereof we speak at present, show'd that it was, beyond a doubt, to be referr'd to some one of these classes), she began to discharge, at intervals, such a vast quantity of inodorous water, by the urinary passages, that the tumour of the belly vanish'd away within nine days ; and she soon after recover'd her health, to such a degree, that she had now liv'd five years in very good health, when the history was written.

But an observation had been before publish'd, by the celebrated Christopher Ernestus Conus (s), of a matron, who, supposing herself to be pregnant at first, had spent the space of five years with a tumid belly ; but with a florid colour of the face, and an undeprav'd appetite ; her sleep being tranquil, and her respiration very free ; having no tumour of the feet, and no diminution of the urinary discharges : but after that, her feet becoming tumid, and her belly being distended to the degree that will be mention'd presently ; and the disorder having now continu'd seven years ; it happen'd that she fell down, and struck her belly most violently, against a flinty pavement.

And soon after this, the same thing happen'd to her that happen'd to the virgin ; I mean, she now and then excreted urine of the same kind ; and that in so large a quantity, that, by the help of a copious sweat, which flow'd spontaneously at the same time, it was sufficient to empty her belly ; which, by this means, becoming rugous, and entirely collaps'd, was extended beyond her knees : she therefore liv'd in good health for two years ; till at length she was carried off by a dysentery of an epidemic kind.

To these two women therefore, an accidental fall was as happy, as it was unhappy to an equal number spoken of above (t).

And lest you should happen to suspect, that, in the cases of this virgin and matron, the water was discharg'd for this reason, that it was included in the cavity, not of the belly, but of the uterus ; as in some patients spoken of by Cunradus (u), whose fall was happy likewise ; you may take it for granted, that in the two women we have spoken of now, the water did not flow out from the uterus : as they did not discharge it in an involuntary manner, but could even restrain it at pleasure.

19, But in regard to that dropfy of the uterus, which I spoke of just now, and of the tube of the uterus ; there are certainly very few things to be pointed out and added to the Sepulchretum.

There is, indeed, one instance however, of a dropfy of the tube, and one that I have already made mention of to you (x) ; but in too brief and cursory a manner, as the book was not then in my hands : for it is, certainly, by no means a common instance ; that is to say, it is an instance of the tube containing about a hundred and fifty pints of water, in a woman, who,

(s) Dissert. inscripta Casus Hydropicæ lapsu sanatae.

(t) n. 16.

(u) Dissert. de Hydr. Uteri c. 4. §. 3.

(x) Epist. 38. n. 66.

having been suppos'd, at first, to be pregnant, and, after that, to labour under an ascites, died at length, and was dissected by Abraham Cyprianus (y), who had not been willing to undertake the cure of the patient; and that certainly for very prudent reasons too: for besides water, he would have found, within the tube, many "carcinomatous tumours."

And you will have an instance of a dropical uterus, from Brehmius (z), in a matron, who; being suppos'd, by a great number of physicians, to have labour'd under an encysted dropsy, for the space of two years; by means of an emenagogue medicine, which she had taken, discharg'd cysts from the uterus, to the number of seven; in one of which the skeleton of a foetus was actually contain'd; and in the others a serum which smelt very disagreeably; so that you might perceive the dropsy to have arisen from an unhappy pregnancy, though it was contain'd within sacs.

And you will find, in the history which you read in Cunradus (a), that a very great quantity of water was contain'd in one large bag, in a woman who complain'd of nothing else but a sense of weight; her feet not being tumid; and she having no sense of fluctuation of water when she mov'd her body; and what every one most of all wonder'd at, for about six years together; for so many years was it that she labour'd under this tumour; she was not only not emaciated, but was not even deficient in her menstrea, which continu'd to have their regular discharge all the time.

Which circumstance, and the dissection likewise, may make you doubtful whether that bag was to be consider'd as the uterus itself: for many of those persons who were present at the dissection, suspected some other body rather, which resembled the uterus, and occupied the seat of it; and from thence the tumour had first begun, by the size of a man's fist; to be really the uterus.

But because that verybody was schirrhous, and deprav'd by other disorders; and did not communicate with the vagina, which was quite shut up beneath it; and the sanguiferous vessels, which crept through that bag, did communicate therewith; when you have read over all the circumstances, and consider'd them attentively, you will judge whether that bag is not, at least, to be consider'd as a distended part of the uterus; and, in the mean while, will consider from the same dissertation (b), the marks whereby it is said that the hydrops uteri may be distinguish'd either from other species of dropsy, or from disorders of the uterus itself; I mean, such as schirrhous and cancer.

20. In regard to these last-mention'd diseases, to my two observations, which I have already given you (c), you may join as many from those celebrated men, Kieslingius (d), and Roederer (e); and compare them with that

(y) Epist. hist. exhib. foetus hum. post. 21. menses &c.

(z) Dissert. supra ad n. 17. cit. §. 2.

(a) Dissert. supra ad n. 18. cit. c. 1. §. 14.

(b) c. 3. §. 3.

(c) Epist. 38. n. 34. & Epist. 39. n. 33.

(d) Dissert. quæ inscribitur Uterus post. part. inflamm. §. 13.

(e) Dissert. de Uteri Scirrhus n. 18.

state of the ovaries also, of the tubes, and of the urinary bladder, which was found by me, and by both of these authors; or one of them; at that very time. For I do not here add any-thing else on the uterus and bladder, or upon the other urinary and genital parts; as I shall write many things upon their disorders in the following letters. Farewel.

LETTER the SIXTY-SIXTH

Treats chiefly of Disorders that affect the Urinary Bladder.

1. **A**S I am about to write of diseases, which relate to the urinary and genital parts; according to my promise in the preceding letter; I will first produce an observation, which relates to both one and the other class of organs; and afterwards I will give you some that relate to the former, and others that relate in particular to the latter: and these I shall communicate to you in this and the following letter, in the same method I am wont to pursue.

2. An old woman, who had already labour'd, for seven months, under pains in the lower part of the belly; particularly at the time of discharging her urine; had been in the hospital for the first months. She return'd home however from thence, but at length came back to the hospital again; being tortur'd with those excruciating pains, and the urine, as often as ever it was discharg'd, depositing a great quantity of pus. Finally, being seiz'd with convulsions, she died near the end of the year 1757.

As I had immediately order'd the intestines, at least, to be taken out of the body, which I was not at leisure to examine, till some days after death; I at length look'd carefully over all the organs that were created for the sake of the urine, and for generation.

Betwixt the ovaries, which were white, schirrhous, and small, was a small uterus also, that was pretty sound, both internally and externally; except that, externally, it had, on the back part of its fundus, a kind of round pimple, as it were, full of whitish serum.

But the vagina; from the orifice of which a very filthy matter was discharg'd; and the bladder also, being laid open; the whole internal surface of both of them appear'd to be eroded as it were, and cover'd with a cineritious, thick, and very foetid pus: and if you attempted to remove this pus by the handle of the knife, the substance of both these corroded parts follow'd at the same time; so that it was manifest both of these organs had labour'd under a most filthy cancer.

And

And so great had been the purulent discharge, that the bladder; which, before it was cut into, seem'd to be half full of urine; appear'd to be so from the pus which it contain'd. However, although both the ureters were in a state of considerable dilatation; and in particular the right; yet I could find no disorder by cutting into, and examining, the kidneys.

3. I have produc'd this history, that you may compare it with others, which I have already pointed out (*a*): among these is mine also (*b*), which, though of a different nature in some things, is nevertheless similar in this, that a violent disorder had occupied the genital and urinary organs at the same time. We will now add other things, which relate to these last-mention'd parts in particular.

4. And first, when you read over again that letter, wherein; speaking of the difficulty of making water, and particularly from calculi; I hinted a few things, in regard to waters, which are more or less apt to generate calculi (*c*); I would have you add the experiments, which were made, in considerable number, and with great accuracy; in the examination both of the waters of his own native place and others; by Vincent Menghini (*d*), who was lately snatch'd away, from his fellow-citizens at Bologna, by an untimely death, and that to their great grief and disappointment.

For he even found amongst well-waters, some which not only do not increase calculi, but diminish them; and quite dissolve some. And the same water; being drunk by persons affected with calculi, and made use of to prepare wines and broths; have prov'd their own efficacy, in this way, by the successful event.

And with that needle, which was carried through the male urethra, into the bladder, and there encreas'd in its size, by the addition of a calculus, which had form'd itself thereupon; as I have describ'd in the same letter (*e*); you may also compare that ear of wheat (for of an ear of barley you have read of in the same place (*f*)) which another man (*g*); when he was formerly in the country; and was there very much excruciated by the discharge of sandy particles in his urine; had introduc'd into his urethra, in the room of a small candle; but had not been able to draw back again, by reason of the resistance that was given by the sharp points, so as to occasion the most severe pain; and had therefore left within the urethra: and this ear of wheat the lithotomist finally extracted from the bladder itself, in the form of a cluster of grapes, which a stony matter had incrusted.

When you have compar'd these things; you will also compare those remarks which I then made, that the great difference which there was betwixt my observation, and others of the like kind, might evidently appear.

5. But in regard to the obstacle which is oppos'd to the discharge of the urine, by the growing out of the prostate gland; you will remember that I

(*a*) Epist. 47. n. 26.

(*b*) Epist. 39. n. 33.

(*c*) Epist. 42. n. 17.

(*d*) Comment. de Bonon. Sc. Inst. Tom. 4. Obs. Anat. 1.

(*e*) n. 28.

(*f*) n. 29.

(*g*) Hist. de l'Acad. R. de Sc. A. 1753.

in Opusc.

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have not only written on this subject, in the same letters, but in others also; and particularly in those which had immediately preceded them (*b*).

But now we must add other things. For that tubercle, which I had sometimes found in the very beginning of the urethra; and had consider'd, at least, as an incipient excrescence of this gland; I have lately found to be consider'd as a small part, that is quite natural and common to all bodies, and is call'd *uvula* by a celebrated anatomist; whose name I do not omit to mention here, because I do not esteem his ingenuity, his diligence, and his other merits, as much as I ought to esteem them, and as these very letters of mine shew that I do in more places than one; but only, in order that I may preserve my usual custom, whenever I am oblig'd, by my love of truth, to dissent from any learned and eminent man who is still living; and especially from any one who is a member of that famous society, of which he is a member.

If therefore that *uvula* of his really exist in all bodies; for I will here make use of that word by way of brevity; it is with great reason that he wonders I have never seen it.

But I have much more reason to be surpris'd here, than when (*i*) I very plainly saw, in that part, a slightly protuberating line, which goes down to the feminal caruncle; and even another small line, much more slender than the former, in this caruncle; which line, for instance, is the orifice of the sinus contain'd within that caruncle; I nevertheless could not attain to the sight of a body so much more protuberant, and comparable with the uvula: and not only then, when I first observ'd the little line of the caruncle; but neither before, nor since, when I attentively inspected that part of the urethra in its natural state; which I will not take upon me to say how many times I have done: this however I can affirm, that I had begun to do this before the beginning of the present century; and in how great a number of bodies, my friends at Bologna, and Venice, very well know: for in how many I have done it at Padua, every year, for these four-and-forty years past, either in the college, or in the hospital, all the students have been witnesses.

What then is the state of the argument? Do I call in question what has happen'd to others? No. I only declare ingenuously what has happen'd to me.

For, that you may plainly perceive, how seldom I saw this; in so great a number of examinations that I have made; you may take it for granted, that all the observations of this kind, return to those very few, which; having already written them to you, on former occasions; I shall only take notice of now; or which, if I have never yet had an opportunity of writing, I shall here faithfully subjoin.

See therefore, how, in the shoemaker (*k*), I found a pyriform beginning of that uvula: for it was somewhat larger than the subjected feminal caruncle; whereas, in the body which had been affected with an ascites (*l*), and in the rustic (*m*), in like manner, I met with it of a larger size; as it

(*b*) Epist. 41. n. 17. & seqq.

(*i*) Advers. Anat. I. n. 9.

(*k*) Epist. 37. n. 30. in fin.

(*l*) Epist. 41. n. 18.

(*m*) Epist. 43. n. 24.

equall'd that of a small grape; and somewhat larger in a man, whose history I shall immediately describe to you for that one reason only.

6. A man; who was very near sixty years of age, of a muscular habit, and tall in stature; had died in the hospital, of a suppurated inflammation of the thorax; and that on the fifteenth day of the disease. None of the viscera therefore, but the viscera of the belly, were brought to me from this body; at the time of my beginning to teach anatomy in the college, before the end of January, in the year 1755. And in these viscera I only observ'd the following preternatural appearances.

In the stomach, from the ring of the pylorus, a roundish excrescence was prominent; which, internally and externally, was of the same colour with that ring of the substance whereof it was compos'd.

In the mesentery, were very few glands indeed; but these were larger, than were proportion'd to that age. The spleen was rather small, and internally almost in a liquid state. The large artery had begun to shew whitish spots on its internal surface; which spots would, afterwards, have degenerated into bone.

And finally, the urinary bladder, having been distended with a sufficient quantity of introduc'd air, appear'd to be small, if you compar'd it with the stature of the man; and with the greater part of the abdominal viscera.

When open'd, however, it did not seem to have very thick coats, nor any other disorder; except that, from the posterior part of the orifice, a body of the shape, and magnitude, of a small cherry, was prominent within it: and the more this descended through the beginning of the subjected urethra, the more and more was it extenuated; so that it did not reach to the feminal caruncle.

Externally it was smooth: white both externally and internally; and so evidently a continuation of the prostate gland, and similar thereto, in the other part of its substance, that you would not doubt but it must have grown out from thence.

7. Now if you compare this fourth, and those other three descriptions of mine, which I referr'd to before (*n*), of this excrescence, with the description of that uvula whereof I am speaking; it will be very easy for you to see, that I had seen the same things, whether this corpuscle was small, or become much enlarg'd.

Why then, if it were in all persons, I should not have seen it in other almost innumerable bodies; in which I had, down to that very time, inspected these parts with equal attention, as my custom is; I can by no means conceive.

But perhaps you will say, take care lest your memory deceive you; for I think, I remember to have seen you take notice of excrescences in those parts, in some other bodies also, in your writings. And indeed I had seen excrescences about those parts, and even in those very parts; but not excrescences of this kind.

For that which I have describ'd in Cortini(*o*), was about those parts indeed; but at the side, and not from the substance, of the prostate: being produc'd

(*n*) N. 5. in fin.

(*o*) Epist. 42. n. 13.

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from the substance of the bladder. And as to that which I have taken notice of, in the first of the Anatomical Epistles (*p*), in a certain old man, whose body I examin'd twelve years after the other; this was indeed found at the beginning of the urethra, so as to stop up, in some measure, the orifice of the bladder: but it was fleshy, unequal, flaccid, and reddish.

And that which I have describ'd to you, from the body of a certain man who died suddenly (*q*), in its form, situation, substance, and origin, perfectly agreed with that we are speaking of here; but differ'd from it in this, that it was double; and not single only.

Yet that double excrescence, which you have read of, as being found by me, in a woman (*r*), was still more different; as it was not only made up of two excrescences, so disjoin'd from each other, that one of them was prominent from each side of the orifice of the bladder, within its cavity; being equal in size to the point of a man's thumb; but these bodies were moreover of an irregular figure: as to other circumstances, both of them were white, and produc'd from the surrounding corpus glandosum urethræ, which very body was white also here, hard, and become thick.

For, although I will not say, that this body performs the same offices, in general, with the prostate; I shall not deny, nevertheless, but it corresponds to it in some of them.

And this I was willing to add, because I see that this uvula is suppos'd to exist in women also, yet to be less prominent than in men; although it has not yet ever happen'd to me, to find an excrescence of this kind in females, in the same situation as in males; either in a smaller or a larger degree.

And lest you should suspect, that if I had read those things, which have been just now said of this uvula, before I very attentively examin'd the upper part of the urethra, so frequently, in both sexes, I should probably have been more ready to acknowledge these appearances, both in men and women; I will faithfully communicate to you all the dissections which I was capable of making in the very short time since I have read those things; notwithstanding they contain nothing besides this circumstance, that relates to our present purpose: and I will begin with that of a woman.

8. The urinary and genital parts of a woman; who died in this hospital, of I know not what disorder; were brought into the college, where I was teaching anatomy, before the end of January in the present year 1759.

In the genitals I observ'd nothing that was preternatural, besides one or two roundish prominences; both of which were small, and protuberated, in some measure, on the internal, and posterior, surface of the fundus uteri; being of the same kind, that you will remember to have been describ'd by me, at other times, of a larger or lesser magnitude.

But as to what relates to the urinary parts; besides the emulgent artery which is common to all, another artery, which has been seen by me in some bodies, and by many other anatomists, weft off, in like manner, from the trunk of the great artery to the kidney.

(*p*) N. 43.

(*q*) Epist. 42. n. 11. in fin.

(*r*) Epist. 39. n. 33.

But this was only a less usual appearance of nature: yet the trunk itself of the aorta had this preternatural circumstance, that it shew'd white spots internally of a considerable size; which were the marks of future ossification: and not only this, but that it was more narrow in its diameter, than seem'd suitable even to a woman of a low stature.

The bladder, being found, had no prominence at the lower part, and none at the upper part, of the urethra, in like manner; and even not any the least trace of a prominence.

9. The body of an old man; of sixty years of age, as it appear'd to be; was dissected at the same time and in the same place. In regard to which man, I could learn nothing more than this; that before he begg'd for his living at Padua, he was on board the galleys; having been condemn'd, probably, on account of some quarrels. At least many scars of wounds which he had receiv'd, appear'd in the abdomen and the neighbouring parts.

The belly, and the thorax, being cut into, it was found that none of those wounds, but one, had penetrated into their cavity: this one, however, had gone no farther than the omentum, as a small part of this membrane adher'd, in a state of agglutination, within an elliptical little cavity of the peritonæum, which had formerly been perforated; at the same time that the viscera beneath were unhurt.

The stomach; which was almost empty, and yet larger than usual; shew'd a slight phlogosis internally, towards the œsophagus: and the small intestines, externally, shew'd a colour which was partly yellow, but degenerating into brown; and the cystic bile was yellow, but dilute, and almost effete.

The hollow surface of the liver, on the right side, was disfigur'd by a very black spot: the figure of which spots approach'd, in some measure, to the area of a circle; the diameter whereof did not exceed the breadth of a man's thumb. As some fluid seem'd to lie beneath, I cut into the coat of the liver, and found it to be semi-coagulated blood, comprehended in a not very deep cavity.

The internal surface of the great artery had some bony particles scatter'd up and down; but they were small, and not in great number. Among these; to say something of the parts of the thorax also; that was certainly one of the largest which lay upon the very orifice, in which, the canalis arteriosus, that had formerly been open in the foetus, terminated.

The heart was large: and the mouth of the coronary vein had nothing else, in the place of a valve, but a slender filament, produc'd from the upper edge of the orifice to the lower. And this I have related here; as I have other things also; that you might perceive I had made an accurate observation, even of little things, in this body.

With how much more accuracy do you suppose, then, that the uvula was enquir'd after, by me, in the orifice of the bladder of this man, and another to whom I shall refer presently? and of that old woman who was spoken of just now? especially as in this man, when the bladder was already open'd, something, that was of a roundish figure, and moderately prominent, seem'd to protuberate within the neighbouring part of the urethra, which was not yet open'd.

But nevertheless, when the urethra was at length laid open, it immediately appear'd

appear'd that I had been deceiv'd ; and not only I, but all the more diligent students who were present ; together with the experienc'd dissectors : since these observations I made in public, according to my general custom.

For, whatever the cause of the deception might be ; certainly there was not the least prominence ; that we could now attain to the sight of ; in that whole space, which lies betwixt the bladder and the seminal caruncle.

10. But because I am so desirous of learning truth, as to think that whatever I hear, or read, of the structure of the body, that is new, I should enquire after, even in those parts wherein I remember to have seen nothing of this kind, though they have been carefully examin'd by me a hundred times ; I wish to inspect them again and again, to the great, though silent, admiration, and perhaps irksomeness, of those persons who assist me : for which reason, it gave me a very singular pleasure, that an opportunity offer'd itself, in those very days, of cutting into and examining a third bladder.

I therefore begg'd, that not only the viscera of the thorax ; of that man whose history I have written to you, in the latter part of the sixty-fourth letter (c) ; wherein the seat of the disorder was, might be brought to me, but also the organs serving for the offices of generation.

As the bladder therefore, and the urethra, when open'd, seem'd to me to be sufficiently proper, wherein to make an attentive enquiry after that prominence ; I made this enquiry very accurately ; but in vain : for not the least appearance of it was found.

Nay, and even when human bodies were wanting ; that is, after the anatomical demonstrations were finish'd ; I was determin'd to enquire after it in a dog of a considerable size.

This animal I had order'd to be cut open alive, in the college, after the custom of my ancestors ; not only for other reasons, but, moreover, that it might appear, whether no interstice be left betwixt the pericardium and the heart, either in its systole, or in its diastole ; as I had read not long before ; but the pericardium so exactly embraces, at all times, whatever it contains ; or at least in living and healthy bodies ; that no vacuity remains within its cavity.

For as this method of determining it was an obvious one, so it seem'd not to be liable to doubt ; I mean, if the thorax of the dog being open'd ; in such a manner, that not much blood was extravasated ; we immediately tried, while the heart still exercis'd its motions strongly, whether the membrane of the pericardium, before it was open'd, were so closely contiguous to the heart, that it could be by no means, or at least not easily, laid hold of and rais'd up betwixt two fingers.

And this it could be very easily, as was tried by several persons, and seen by all : and I know that the same experiment was since made, upon other dogs, with the same success. In that dog therefore, after having sought in vain, as I had often done before, whether the vesiculæ seminales are not wanting ; but as some seem to believe, are less conspicuous ; I sought after this uvula to no purpose in like manner.

For the bladder, and the urethra, being open'd, as I saw no eminence in

the first, besides those two round bodies, which, descending from the ureters, came together at length at an angle; so I saw that there was no prominence, from this angle quite to the feminal caruncle; but that line into which those bodies were produc'd, and which was not only much narrower, but much more depress'd than they.

I found, I say, nothing protuberating; nor did I find that triangle in the bladder (as I see it is call'd); of which, what I observ'd before, not to say afterwards, in human bodies; and what it seems to me that we ought to think on this subject; and of other things of this kind; since it is not a proper place to say much here; let us immediately return to the uvula, of which I was here under a necessity of speaking.

For I do not doubt, but you are convinc'd, that it is with justice it has been consider'd by me, as a morbid excrescence of the prostate gland; from those things which have either not occur'd to me, for the most part, in human bodies, or have occur'd sometimes only.

11. Nor will you find that it has been consider'd in any different light by others; and particularly by Valsalva and Pohlius; from those things which I have already communicated to you in the forty-first (*t*), and forty-second letter (*u*), that I have sent to you.

For when one of these appearances was seen by each of them, as arising from the same part, in the prostate gland of an old man; the one resembling a pear, and the other a cherry; of the same forms, that is to say, which it was seen by me to have in that shoemaker, of whom I have spoken elsewhere (*x*), and in the man whom I have spoken of above (*y*); neither Valsalva nor Pohlius consider'd it as any certain natural part of the prostate gland, which was accidentally become enlarg'd; but as an excrescence altogether, as it was: or as a preternatural tumour. And indeed, how far the prostate gland is liable to excrescences, which raise themselves up from its superior circumference, or all round, or from a certain part, into the cavity of the bladder; it would be very easy for me to shew, if I were dispos'd to repeat, on this occasion, what I have said on a former (*).

It will be better for you to read it over again: and although there is much on this subject, you will still find that there are other things which may be added, in order to be referr'd to the Sepulchretum; as, for instance, that example of the celebrated Fantonus (*z*): an example, that is to say, of an old man of sixty, who, having died, after a very long-continu'd, and troublesome stillicidium of urine, had the prostate not only purulent, hard, and immoderately tumid, but "produc'd far and wide, towards the lower part of the bladder also: the capacity of the bladder was very small: and the membranes very thick:" which circumstance you will add to those I have written of to you before (*a*).

Do not be surpriz'd, that there was no suppression of urine; but only a very troublesome stillicidium thereof: for, even in the case of Pohlius, only

(*t*) N. 6.

(*x*) Epist. 37. n. 30.

(*y*) N. 6.

(*z*) N. 37.

(*) Epist. 41. n. 17. & 19.

(*z*) De Obs. Med. & Anat. Epist. 8. n. 18.

(*a*) Epist. 42. n. 33. & 35.

more frequent stimuli to make water; whereto were added, at stated times, a dysuria and stranguria; are made mention of: and in that physician refer'd to by me, from Vallisneri, in the forty-first letter (*b*); although the excrescence, which ascended, from the substance of the prostate, within the bladder, was equal to the magnitude of a walnut; to the suppression of urine, nevertheless, a stillicidium thereof only succeeded, join'd with excruciating pains of the urethra, and a tenesmus: nor in regard to the woman, and of the man; whose excrescences of the same kind I have taken notice of above (*c*); have I heard any-thing in relation thereto; except that she was affected with a continual stillicidium of urine, and that he was sometimes heard to complain of an acrimony therein: and I saw the bladder, in each of their bodies, to be distended with urine; as it was in that physician like-wife.

It therefore appears, that, according to the various disposition of circumstances, a different inconvenience is brought on by different causes; and that, as these circumstances are almost infinitely variable, a greater or less impediment is thrown in the way of the egress of the urine, by excrescences of the prostate gland.

12. And I am very well pleas'd to find, that three observations; which I read in the same place where I see that this uvula, of which the question is at present, is propos'd; agree with what I just now said.

For this uvula, having been found, in three bodies, of the thickness of a small nut, (perhaps of a filbert) the first had labour'd under a very troublesome difficulty of urine, with frequent stimuli to make water; the second, for eight days, under an ischuria; of which they were cur'd by the catheter; and the third, under one or the other of these complaints; for which of them it had been was not known; and the bladder of all of them was found to be very full of urine.

But in this we differ, that in them the uvula is suppos'd to have been encreas'd; whereas I am persuaded, by my observations, that an excrescence, quite of a preternatural kind, had protuberated from the prostate gland; without supposing any uvula naturally to have existed.

And my observations are assisted by this circumstance; which I have also observ'd heretofore (*d*), and have even confirm'd in this letter; that none of the appearances of this kind, which I remember to have seen or read of before, were in young bodies, but all in old men: that is to say, in bodies which every one knows, down from the time of Hippocrates (*e*) to the present, are more liable to disorders, and, in particular, to "stillicidia and difficulties of urine."

Nor is that other remark; which you have read of, as being made by me at the same time; any objection to my opinion; I mean, that these excrescences are wont to be from that part of the prostate, through which the protuberating line is drawn: for it is very easy for a line, already somewhat protuberant, to become more tumid; and it is shewn, in the same place, that excrescences of the prostate do not begin from that part alone.

(*b*) N. 17, & 19.

(*c*) N. 7.

(*e*) S. 3. Aph. 31.

(*d*) Epist. 41. n. 19.

And we disagree no less in this particular; I mean, that this uvula, by growing out, is the seat of a very frequent, but very unknown disease.

It is not rare, I confess; but yet it is not so frequent, that; although out of these three patients, the second, who was a very old man, was treated, by the physicians, in the same manner as if he labour'd under a paralysis of the bladder; to which cause, without doubt, that disorder so common to old men is attributed; it therefore follows, that it is not frequently to be attributed to paralysis also; or at least to the state of the expulsive powers of the bladder being weaken'd through age: and indeed if this hitherto unknown cause, as it is suppos'd to be, were very frequent; there would be great reason to wonder how it should happen, that among those sixty or seventy bladders, which were examin'd, no more than these three had been found to have this cause existing in them.

But how this cause can be said to be hitherto quite unknown, I confess I am at a loss to conceive: nor do I say this only on account of those very many examples, which I have referr'd to (f) already, as made public by others; but for this reason chiefly, that such an assertion is made, where these very words of Santorini (g) are soon after quoted: "The orifice of the bladder, whereto is prefix'd a somewhat prominent body, which" is sometimes so very prominent in diseas'd bladders, "as entirely to intercept the passage of the urine."

And indeed in the figure; for the sake of explaining which, Santorini had written these things; the triangle and the uvula are said to be well express'd (both of them, therefore, before these last six-and-thirty years); but why, I pray, is not the same thing said of the disease; the cause of which, he has in the same place, as you see, expressly asserted the uvula to be?

Nay verily; as if he, who had made this assertion, had not in the least observ'd those things which he explain'd; it is doubted whether we do not rather owe these appearances to the limner, who faithfully express'd what he saw: and that so much the more, because, in the book of Santorini; on account of which, that figure, as well as the others, is added; the description of this uvula is sought for in vain; and because of the triangle there is not even a single word, in the very article which corresponds to that figure.

But as you, when you examine the book of Santorini, will not doubt but the tenth chapter corresponds to that figure; as it is entitled *De Virorum Naturalibus*; so you will also find that this very figure is often referr'd to there in the margin: and those little parts, whereof the question is at present, are at length twice spoken of (b).

And in the first place in the following manner: "Although I have now and then seen something posterior, of which I shall speak presently, protuberant, into a considerable bulk, at the orifice of the neck of the bladder; it is either very rarely met with, or we have observ'd it to be so far protuberant, in those subjects only, whose bladder was affected with

(f) Epist. 41. n. 12. 17. 19.

ad I.

(g) Obs. Anat. in Explic. Tab. 2. Fig. 2. (b) §. 20. & 22.

“ disease: so that this circumstance, which is diseas’d and unfrequent, does
 “ not deserve to be exhibited as perpetual and constant, to the great detri-
 “ ment and misleading of younger practitioners; or those who have had
 “ but little experience.”

And in the second place the words run thus: “ But that which is some-
 “ times so prominent, at the orifice of the cervix vesicæ, as to be capable
 “ of intercepting, in some degree, the passage of the urine, is cover’d over
 “ by the thin internal membrane of the bladder, in such a manner, that I
 “ have sometimes seen it made up of conspicuous and aggregated glands:
 “ and I remember to have seen the wide circumference of this body, round
 “ about, occupied by protuberating glands; though of a small size; in an
 “ old man, within whose bladder above six-and-thirty calculi, of a white
 “ colour inclining to yellow, were contain’d; some of which calculi, being
 “ not much less than a filbert, were shut up in sacculi constructed of the very
 “ strong and divided fasciculi of the same bladder.”

It therefore appears, what Santorini thought of the uvula, and of the tri-
 angle also; for he seems to have spoken of both at the same time; although
 my opinion, in regard to some things there propos’d by him, is different
 from his: however, I consider nothing here, but that the disease, which
 is sometimes to be ascrib’d to this excrescence, was not unknown even
 to him.

i3. But in regard to the very small glands of the bladder; what I have
 seen, and what I think of them, has been said by me on a former occa-
 sion (*i*). And as to those sacculi, or, as I have call’d them, vesical herniæ,
 observ’d by me in the spaces which the fasciculated fibres of the bladder
 surround; in consequence of the coats giving way to the pressure of the
 urine, which is sometimes retain’d in too large a quantity; it has been
 sufficiently declar’d by me, in the forty-second letter (*k*), how long ago I
 publish’d these things, and in what work; in which letter I also said much
 upon the subject of calculi included in these sacculi; and of the deceptions
 which may arise from thence to lithotomists.

And for this very reason, I take notice of these, and the following things,
 to you; I mean, because I am under a necessity of adding, if not many
 things, at least not very few, as well in regard to that uvula, as in regard to
 other matters, which I have sometimes advanc’d, when writing to you, or
 to others; things which I am compell’d by a love of truth to remark, when
 I consider what I have lately read of this uvula, and of the bladder; and
 what I had formerly read of this last-mention’d part; not only in the greater
 number of anatomical writers, but particularly in an author who was to be
 preferr’d before many, I mean my friend Santorini, in that very tenth
 chapter which I just now quoted.

Attending therefore to his descriptions and figures, and the descriptions
 and figures given by others, of the fleshy fibres of the bladder, and com-
 paring them with what I had been able to see (*l*) in the last months of the
 year 1725, and the first months of the following year; I thought I might

(*i*) Epist. Anat. 1. n. 63.
 (*k*) n. 30. & seqq.

(*l*) Epist. Anat. 1. n. 60.

make this conclusion in particular: that there is so great a variety in the disposition of those fibres, as to make it impossible to reduce them to any one certain and constant description.

I was not greatly surpriz'd therefore, when I lit on the varying figures of others; as, for instance, of that eminent man William Rutty (*m*); or when I found the illustrious professor of anatomy, Albinus (*n*), admonishing us, in respect to that muscle of the bladder; which he gives a figure of as rising from the ossa pubis, and extending itself through the lower part of the bladder, almost transversely, and continuing itself to the rest of the fibres thereof; that it had been "very seldom" seen by him.

Nor did I wonder, when in the year, if I remember rightly, 1731, I read the description of Joh. Wilhelmus Albrecht (*o*), the whole of which I must copy to you here; not only on account of the variety, but for this reason also, that he has propos'd it, contrary to the opinion and custom of other anatomists.

"In the urinary bladder of a robust man," by the anatomical pipe of Wolfius, "we separated six very distinct coats, which are commonly consider'd, by authors, as a triple membrane. But as to that which is call'd the muscular coat; I do not see with what propriety it can be number'd amongst the coats. For the muscular fibres do not coalesce into one continu'd membrane; but, being collected on one side and on the other, like fillets of an inch in breadth, or even not so broad, go round the bladder, meet one another without any order, and, cutting one another at different angles, are terminated in membranes, either about the neck, or about the sphincter itself."

I, however, do not believe that any one author; who has enquir'd into the fleshy fibres of the bladder, more than once, in a proper manner; has fail'd to see the interstices which they leave betwixt one another: and I, therefore, suppose that this author, or any others of the same class; if they happen'd to be ask'd, whether these fibres, which are so entangled one with another, as to comprehend betwixt them *areas*; under which name I have spoken of these interstices in the *Adversaria* (*p*); whether these fibres, I say, could with propriety be call'd by the name of a reticular muscle; would no less readily affirm it of these fibres, than of those of the detrusor urinæ muscle; nor with less readiness than they have call'd that membrane of the bladder muscular, by reason of these fibres; which membrane had these fibres lying upon, or interwoven with, itself, and join'd them together by its intertexture.

You see then, in what sense I have also, in conjunction with others, call'd this membrane, or coat, fleshy or muscular; I say, in conjunction with others.

For although he, whose loss we lately lamented, I mean the celebrated Fantonus (*q*), said, twenty years before Albrecht, the following things upon the subject of these fibres, and upon this membrane of the bladder: "These

(*m*) Treatise on the Urinary Passages. Tab.
(*n*) Tab. Sceleti, & Musc. corp. hum. Tab.
12. Fig. 41.

(*o*) Observat. Anat. §. 5.
(*p*) III. Animad. 36.
(*q*) Anat. corp. hum. Dissert. 7